Volume 135
Article 04

FISHERY MANAGEMENT INVESTIGATIONS

**FEDERAL AID IN FISH RESTORATION**
**1995 JOB PERFORMANCE REPORT**
**PROGRAM F-71-R-20**

**Steven M. Huffaker, Director**

**REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS**
**MAGIC VALLEY REGION (Subprojects I-E, II-E, III-E, IV-E)**

PROJECT I. SURVEYS and INVENTORIES
- Job a. Magic Valley Region Mountain Lakes Investigations
- Job b. Magic Valley Region Lowland Lakes Investigations
- Job c. Magic Valley Region Rivers and Streams Investigations

PROJECT II. TECHNICAL GUIDANCE
PROJECT III: HABITAT MANAGEMENT??
PROJECT IV. POPULATION MANAGEMENT

By:

Fred Partridge
Regional Fishery Manager

Charles D. Warren
Regional Fishery Biologist

Karen A. Frank
Fishery Technician

January 2003
IDFG 02-34

## TABLE OF CONTENTS



## LIST OF FIGURES

## TABLE OF CONTENTS (Continued)



## LIST OF TABLES

## TABLE OF CONTENTS (Continued)



## LIST OF FIGURES

## TABLE OF CONTENTS (Continued)



## LIST OF TABLES

## TABLE OF CONTENTS (Continued)

## TABLE OF CONTENTS (Continued)



## LIST OF FIGURES

## TABLE OF CONTENTS (Continued)

# 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-20

Project I: Surveys and Inventories

Subproject I-E: Magic Valley Region

Job: a

Title: Mountain Lakes Investigations

Contract Period: July 1, 1995 to June 30, 1996

## ABSTRACT

Upper Box Canyon and Lower Box Canyon lakes were gillnetted on August 21 and 22, 1995. Upper Box Canyon Lake yielded 4 bull trout *Salvelinus confluentus* and 18 brook trout *S. fontinalis*. Brook trout lengths ranged from 85 mm to 230 mm, with a mean length of 183 mm. Bull trout lengths ranged from 350 mm to 450 mm, with a mean length of 395 mm. No fish were collected although two were observed in Lower Box Canyon Lake. Limnological data and bathometric profiles were recorded at Lower Box Canyon Lake.

In 1995, four alpine lakes were stocked with 4,800 Arctic grayling *Thymallus arcticus*. Four additional alpine lakes were stocked with 5,500 Henrys Lake cutthroat trout *Oncorhynchus clarki.*

Authors:

Karen A. Frank
Fishery Technician

Fred Partridge
Regional Fishery Manager

## OBJECTIVES

To obtain current information for fishery management decisions on mountain lakes, including angler use and success, fish population characteristics, spawning potential, stocking success, limnology, morphology, and notes on other aquatic life; and to develop appropriate management recommendations.

## METHODS

Cutthroat trout *Oncorhynchus clarki* from Henrys Lake and Arctic grayling *Thymallus arcticus* fry were stocked in alpine lakes by fishery management personnel from a vehicle or by backpack.

Fish populations in Upper and Lower Box Canyon lakes were sampled with Swedish-made Lundgrens Type A lightweight multi-filament gill nets. These are sinking nets, measuring 1.5 m wide with six 7.6 m panels and the following bar mesh sizes: 46, 38, 33, 30, 25, and 19 mm. A small inflatable rubber raft was used for setting and retrieving gill nets and for bathometric profiles. Fish data analysis included total length frequencies.

Limnology data such as alkalinity ($CaCO^3$) and total hardness was measured at the regional office the day after collection using a HACH water chemistry kit. Specific conductivity was also measured using a Sulu Bridge conductivity meter. Water for these specific tests was collected by surface grab samples in opaque plastic bottles. Water temperatures were also recorded using a standard Celsius thermometer. Bathometric profiles were taken using nylon rope marked in 1 m increments.

## RESULTS AND DISCUSSION

### Alpine Lake Stocking

Eight alpine lakes were stocked with fish fry by fishery management personnel in July, August and September 1995. Independence Lake #2 was stocked on July 28, 1995 with 2,000 Arctic grayling, and Independence Lake #3 received 1,000 Arctic grayling. On August 18, 1995 Hideaway Lake was stocked with 1,000 Arctic grayling, and Big Lost Lake received 784 Arctic grayling on August 8. On August 18, 1995 Big Trinity Lake received 2,000 cutthroat trout, Little Trinity Lake received 1,000 cutthroat trout, and Titus Lake received 500 cutthroat trout. Lake Cleveland received 2,040 cutthroat trout on September 6, 1995.

### Upper Box Canyon Lake

Upper Box Canyon Lake is located in the headwaters area of Box Canyon, a tributary to the Little Wood River (UTM Z 11, 736,110 E 4,845,780 N). It lies in a south-facing cirque basin

at an elevation of 2,947 m and has an area of about 0.8 ha. Bathometric profiles previously conducted in 1991 show a maximum depth of 7.5 m (Partridge and Warren 1994). On August 21, 1995, the alkalinity level was 17.3 mg/l with a hardness of 17.0 mg/l and conductivity of 40 μmhos/cm. Water temperature at 8:00 p.m. on August 21, 1995, was 12.8°C.

Prior fish stocking activities in Upper Box Canyon included 100 brown trout *Salmo trutta* at 6.8/kg stocked in September 1988 to provide a predator to reduce density of the brook trout *Salvelinus fontinalis* population (Partridge et al. 1990). This release was apparently unsuccessful, since no brown trout were captured or observed in subsequent samples (Partridge and Warren 1994). An additional effort to provide a predatory fish resulted in the stocking of 102 bull trout *S. confluentus* on September 2, 1993 (Partridge and Warren 1995). These fish were adipose fin clipped and averaged 299 mm prior to release.

Fish populations in Upper Box Canyon Lake were sampled using two gill nets on August 21, 1995. Both nets were pulled two hours after placement to reduce injury to bull trout. A total of three bull trout and 18 brook trout were netted. Additionally, one dead bull trout measuring 350 mm was found along the south side of the lake. This fish apparently was an angler-induced mortality since it had been gutted. Bull trout lengths ranged from 350 mm to 450 mm, with a mean length of 395 mm (Figure 1). Bull trout weights ranged from 530 g to 890 g with a mean of 707 g. Brook trout lengths ranged from 85 mm to 230 mm with a mean length of 183 mm. Brook trout weights ranged from 6 g to 105 g with a mean weight of 58 g. Brook trout averaged 185 mm in 1991.

From shoreline observations, brook trout numbers appear to remain abundant in Upper Box Canyon Lake, and sizes have not changed significantly since the bull trout release in 1993. However, bull trout are just beginning to reach a size where they may begin to have an impact on brook trout numbers if a sufficient number of bull trout are still present.

## Lower Box Canyon Lake

Lower Box Canyon Lake is located in the headwaters area of Box Canyon, a tributary to the Little Wood River (UTM Z 11, 737,520 E, 4,844,700 N). It lies in a north facing cirque basin at an elevation of 2,690 m and has an area of about 1.2 ha with a maximum depth of 6 m (Figure 2). On August 21, 1995, the alkalinity level was 11.0 mg/l with a hardness of 10.5 mg/l and conductivity of 30 mhos/cm. Water temperature at noon on August 22, 1996 was 13.9°C.

Fish populations on Lower Box Canyon Lake were sampled using two gill nets during midday on August 22, 1995. Both nets were pulled 2 hours after placement. No fish were collected in the gill nets, but two live fish between approximately 305-355 mm were observed in the lake. One cutthroat trout mortality of about 305 mm was also observed in the lake. Anglers also had reported seeing several dead fish early in the summer shortly after ice out. The lake normally does not have a winter kill problem, but a long winter following a very dry year may have resulted in poor survival conditions. A heavy snowslide also had passed over the lake.

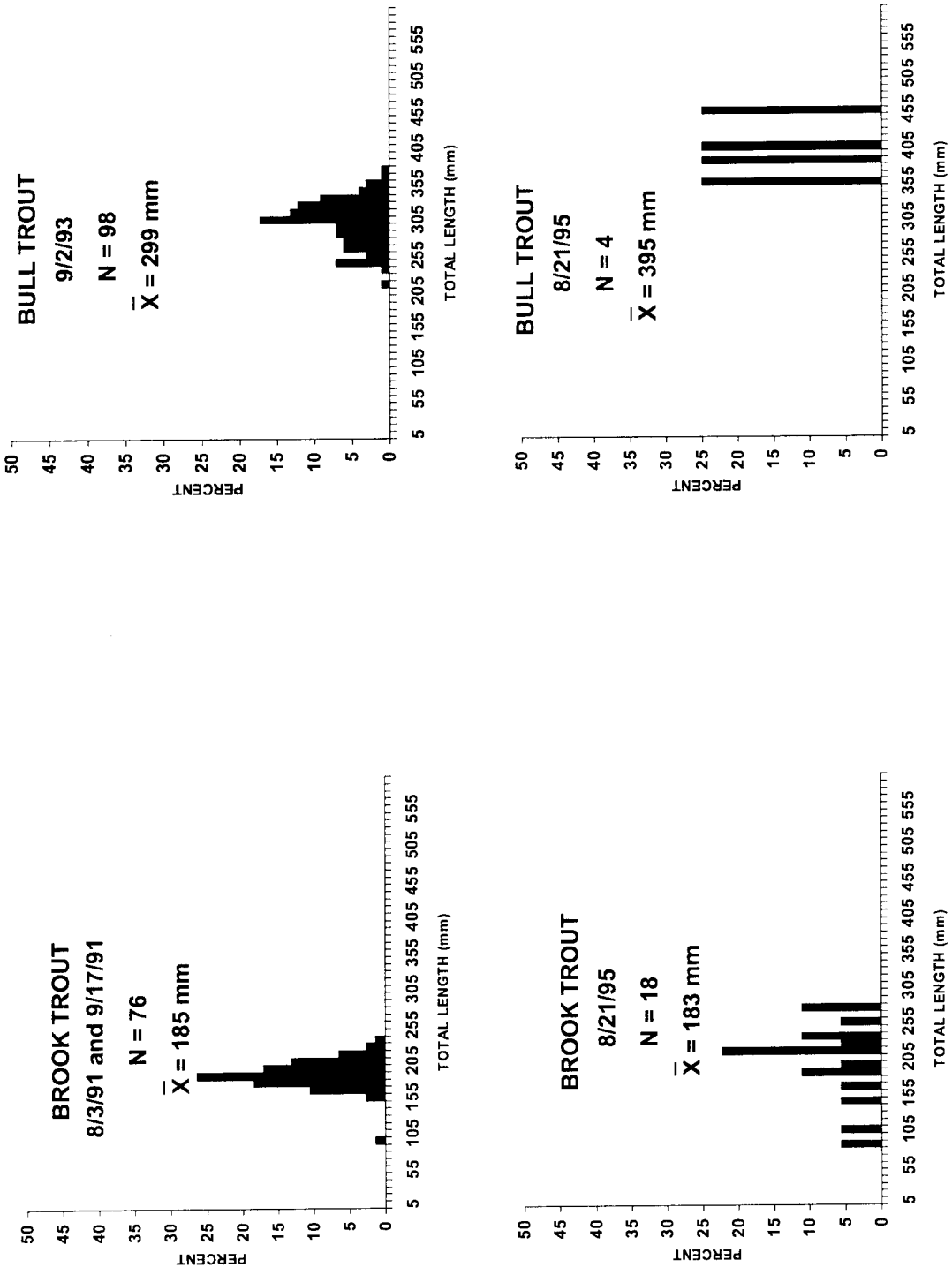


Figure 1. Total length frequencies of fish sampled from Upper Box Canyon Lake . in 1991, 1993 and 1995.

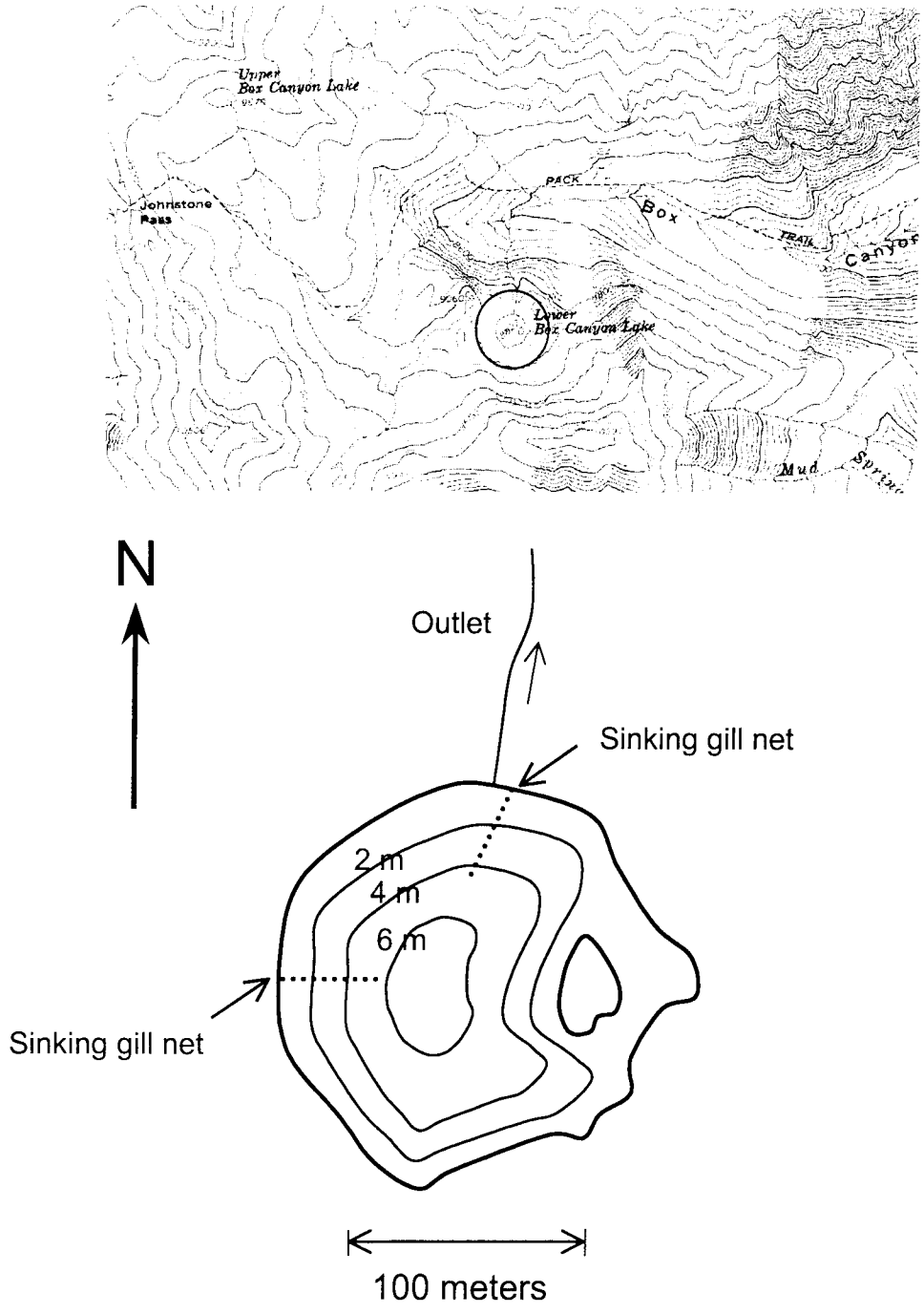


Figure 2. Map of Lower Box Canyon Lake and location of gill nets set and pulled on August 22, 1995.

## ACKNOWLEDGMENTS

Biological aide Jason Cole assisted with lake sampling and stocking fry along with Conservation Officers Bob Sellers and Roger Olson.

## LITERATURE CITED

Partridge, Fred E., Charles E. Corsi and Robert J. Bell. 1990. Regional Fisheries Management Investigations. Idaho Department of Fish and Game, Job Performance Report. Project F-71-R-13, Boise.

Partridge, Fred E. and Charles D. Warren. 1994. Regional Fisheries Management Investigations. Idaho Department of Fish and Game, Job Performance Report. Project F-71-R-16, Boise.

Partridge, Fred E. and Charles D. Warren. 1995. Regional Fisheries Management Investigations. Idaho Department of Fish and Game, Job Performance Report. Project F-71-R-17, Boise.

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-20

Project I: Surveys and Inventories

Subproject I-E: Magic Valley Region

Job: b

Title: Lowland Lakes Investigations

Contract Period: July 1, 1995 to June 30, 1996

## ABSTRACT

Nighttime midwater trawling on Anderson Ranch Reservoir estimated kokanee *Oncorhynchus nerka* densities to be 1.9 fish/ha for age 0+ fish, 11.2 fish/ha for age 1+ fish, and 24.6 fish/ha for age 2+ fish. Kokanee spawner trend surveys on the upper South Fork Boise River counted a total of 7,525 adult fish in 1995, the highest number observed since counts began in 1989.

Standardized lowland lakes sampling protocols on the Burley gravel pit pond sampled several warmwater game fish and nongame fish species. Continuously recording thermograph results for the period July through September indicate that conditions are not suitable for trout survival at that pond.

Marked largemouth bass *Micropterus salmoides* of various size classes were stocked into Lower Salmon Falls Reservoir from a small private pond in July and August 1995. Three months after stocking, 39 largemouth bass were sampled by electrofishing from the reservoir with 28% of them recaptured from the fish plant.

Electrofishing at Thorn Creek Reservoir indicated good numbers of three size classes of hatchery rainbow trout *O. mykiss* present including fish from a steelhead *O. mykiss gairdneri* fry plant earlier in the year.

An intensive creel survey on Salmon Falls Creek Reservoir estimated total daytime fishing effort to be 72,721 hours from May 27 through November 10, 1995. An estimated 48,000 fish, which included 2,900 walleye *Stizostedion vitreum* and 11,300 rainbow trout, were harvested within that period.

Author:

Charles D. Warren
Regional Fishery Biologist

## OBJECTIVES

To maintain information for fishery management activities and decisions for lowland lakes and reservoirs.

## METHODS

Kokanee *Oncorhynchus nerka* abundance and age structure were estimated in Anderson Ranch and Salmon Falls Creek reservoirs using a nighttime midwater trawl. Methods used for the trawling and data analysis followed those described by Rieman (1992).

General lakes and reservoirs fishery data were collected and analyzed utilizing standardized fish sampling gear and methodologies. Sampling gear included a Smith-Root Model SR-18 electrofishing boat with a Model 5.0 pulsator, a drift boat equipped with a Coffelt VVP-15 electrofisher powered by a Honda 5000 generator, variable (19 to 64 mm) bar mesh 38 x 1.8 m gill nets, 2 cm bar mesh size trap (frame) nets with a 1.8 x 0.9 m box and five 76 cm diameter hoops, and a 15.2 x 1.4 m long with 6.2 mm bar mesh beach seine. Beach seine samples were taken by holding one end of the seine stationary at the water's edge while the other end was taken straight out into the water perpendicular to the shoreline. With the shore end remaining stationary, the other end was swept shoreward with the lead line held near the bottom. Bottom trawling was done utilizing a 4.3 m wide bottom trawl which was pulled with a 5.2 m Boston Whaler boat powered with a 90 hp Evinrude engine at approximately 1700 rpm. Data analysis included total length frequencies, estimated length-at-annulus back calculated from scale measurements, and trend data used to compare with similarly acquired data from previous years.

Creel surveys were either non-structured types which were nonrandom to estimate angler catch rates or were structured utilizing the Creel Census System (McArthur 1993). For the structured creel surveys, data was obtained for the purpose of estimating total angler effort, number and species of fish caught and size and age structure of fish harvested.

Limnological samples were taken by sampling surface waters for specific conductivity, pH, total hardness, and alkalinity. A HACH kit was used for the total hardness and alkalinity measurements, a Sulu Bridge conductivity meter was used for measuring specific conductivity and an Oakton PhTestr2 was used for measuring pH. Temperature and dissolved oxygen profiles were measured in-situ using a Y.S.I. model 57 temperature/dissolved oxygen meter from a boat. A Secchi disk was used from a boat. An Onset StowAway water temperature data logger was used for continuously recorded temperature information over a period of several weeks. These were set to record temperature every 48 minutes.

## RESULTS AND DISCUSSION

### Anderson Ranch Reservoir

Water levels permitted partitioning the reservoir into three strata for kokanee sampling on the nights of June 29 and 30, 1995. A temperature and dissolved oxygen profile was taken at three sites a few days prior to trawling. Results indicate strong temperature stratification above 10 m in depth (Figure 1). A total of 14 transects were trawled within the three strata (Figure 2). Depths trawled ranged from 7.5 to 28.0 m (stepped) in the lower reservoir strata, 7.5 to 23.0 m in the mid-reservoir strata, and 7.5 to 18.0 m in the upper reservoir strata. Kokanee sampled less than 130 mm in total length were classified as age 0+ fish, kokanee from 130 to 200 mm long were classified as age 1+ fish, kokanee from 210 to 300 mm long were classified as age 2+ fish and kokanee greater than 300 mm were classified as age 3+ fish. Estimated densities were 1.9 fish/ha for age 0+ kokanee, 11.2 fish/ha for age 1+ kokanee, and 24.6 fish/ha for age 2+ kokanee (Table 1). Total length frequencies for each age class with weights of fish sampled are given in Table 2.

Kokanee spawning was monitored with counts of adult fish observed at 13 sites on the South Fork Boise River and Trinity Creek between August 14 and October 4, 1995. Counts have been made at these same sites for spawner trend information since 1989 except for the trap site that was added to the survey in 1990 (Partridge and Corsi 1993). A total of 7,525 spawners were observed, which is the highest number ever counted since counts began in 1989 (Table 3, Figure 3).

### Burley Gravel Pit Pond

Standardized lowland lakes sampling protocols were followed for sampling fish at the gravel pit pond located northwest of the State Highway 27 and Interstate 84 interchange approximately 2.5 km north of Burley, Idaho (Figure 4). The pond surface area is approximately 18 ha and averages about 2 m deep with uniform substrate topography. The substrate is composed mostly of silt and fine sand. The pond receives irrigation return water and probably some ground water seepage. Until 1995 the Idaho Department of Fish and Game had not taken an active role in the management of the pond's fishery due to limited public access. The Department is proposing to upgrade public access there and expects to see an increase in angler use within the next few years.

One floating and one sinking gill net with one trap net were set overnight the evening of June 30, 1995. A total of 42 minutes of electrofishing effort (power on) was expended the night of August 2, 1995. The perimeter of the pond was electrofished at least twice and the middle crossed utilizing the drift boat with the VVP-15 electrofisher. Species sampled include 8 largemouth bass *Micropterus salmoides*, 9 black crappie *Pomoxis nigromaculatus*, 287 yellow perch *Perca flavescens*, 1 channel catfish *Ictalurus punctatus*, 1 brown bullhead *Ameiurus nebulosus*, 11 common carp *Cyprinus carpio*, 89 Utah sucker *Catostomus ardens*, and 50 Utah chub *Gila atraria* (Table 4). Water quality measurements of a surface sample taken from a boat were 169 mg/l for total alkalinity, 8.6 for pH, 625 μmhos/cm for specific conductivity and 220 mg/l for total hardness. Secchi disk visibility measured 33 to 48 cm. A continuously recording

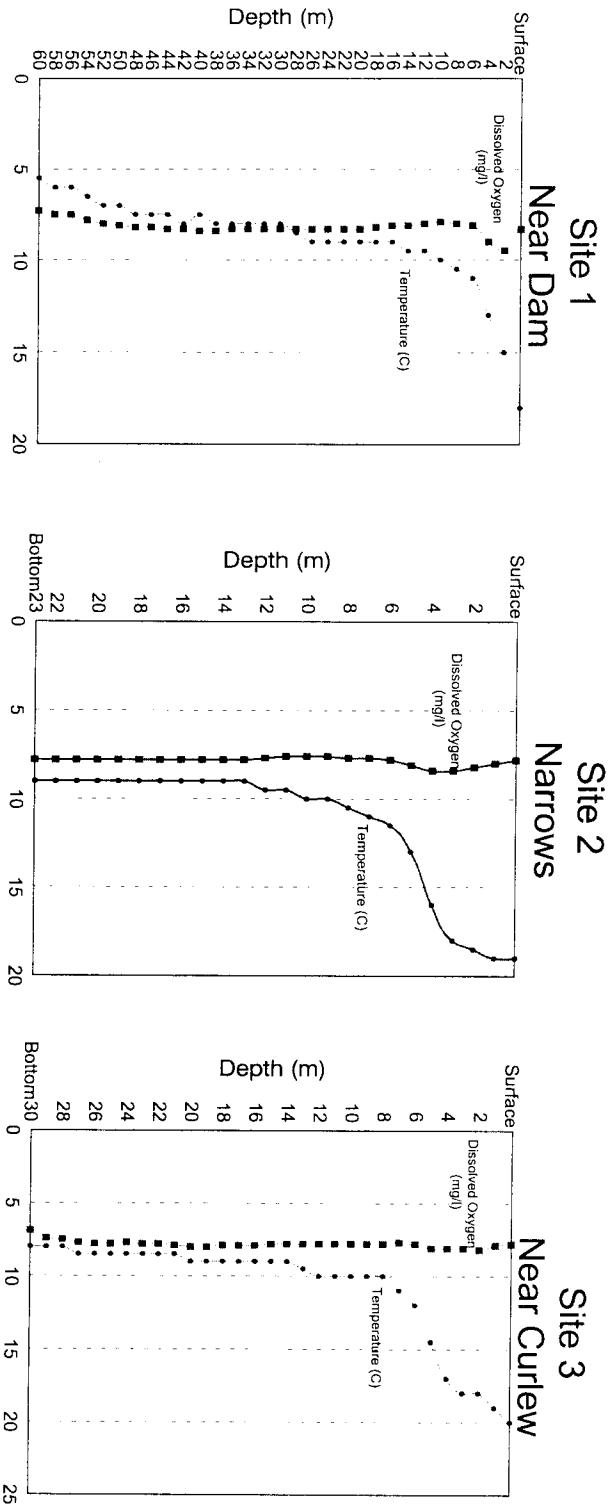


Figure 1. Daytime temperature and dissolved oxygen profiles for Anderson Ranch Reservoir, June 27, 1995.

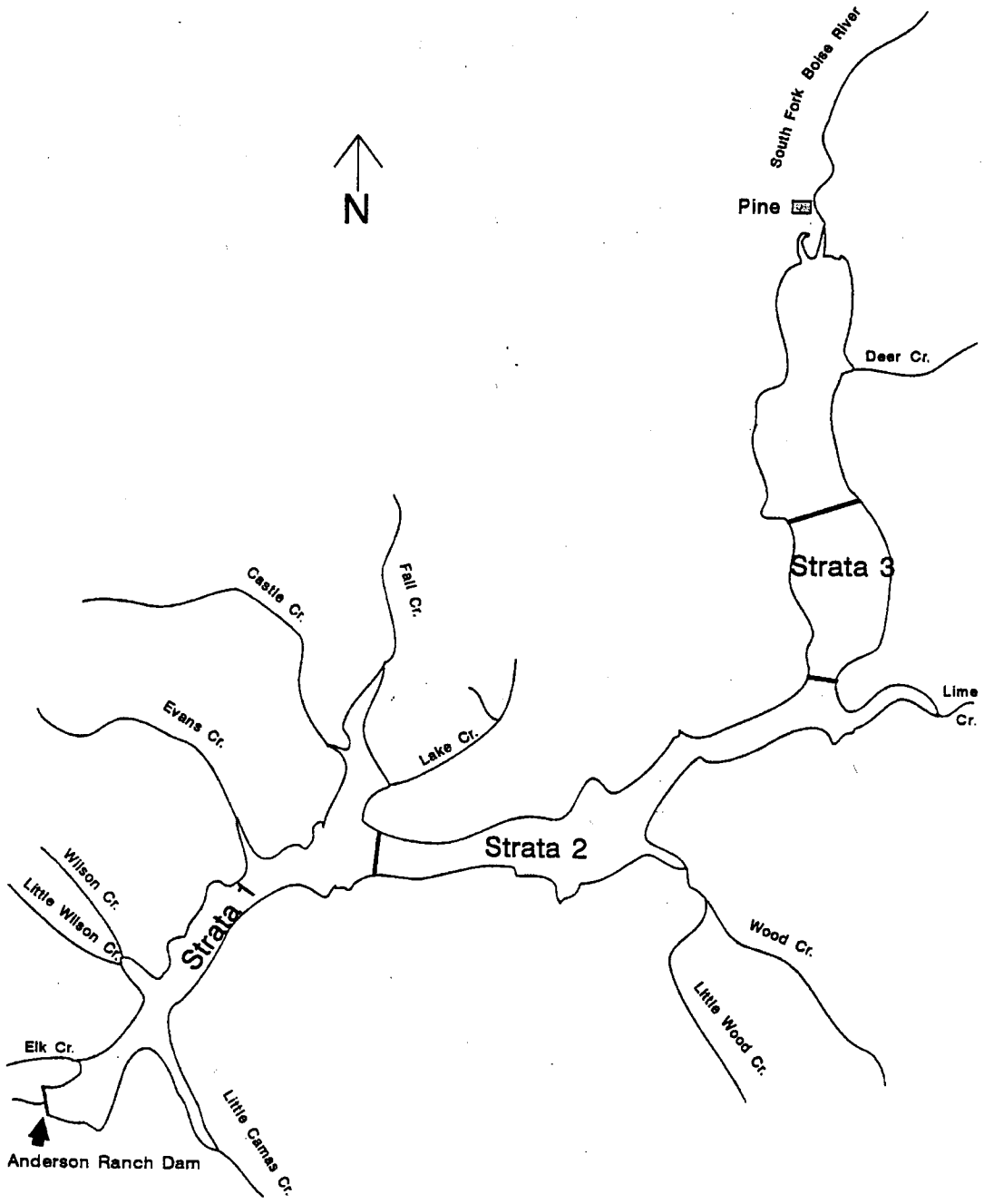


Figure 2. Map of Anderson Ranch Reservoir with boundaries for each strata trawled.

Table 1. Anderson Ranch Reservoir kokanee population and density estimates based on nighttime midwater trawling results, June 1995.

| Mean number of fish/ha (variance) | Age 0+ | Age 1+ | Age 2+ | Age 3+ | # trawls |
|---|---|---|---|---|---|
| Strata 1 | 2.7 (7.422) | 5.3 (10.590) | 5.3 (10.590) | 0.0 (-) | 5 |
| Strata 2 | 2.6 (6.691) | 9.6 (19.733) | 51.8 (120.310) | 0.0 (-) | 5 |
| Strata 3 | 0.0 (-) | 20.6 (170.379) | 14.7 (77.970) | 0.0 (-) | 4 |
| Average[a] | 1.9 | 11.2 | 24.6 | 0.0 | |
| Population estimate | | | | 0.0 | |
| Strata 1 | 1,634 | 3,187 | 3,187 | 0 | |
| Strata 2 | 1,500 | 5,597 | 30,026 | 0 | |
| Strata 3 | 0 | 7,211 | 5,151 | 0 | |
| Total population estimate: | 3,134 | 15,995 | 38,364 | 0 | |
| Variance of pop. estimate: | $3 \times 10^6$ | $3 \times 10^7$ | $5 \times 10^7$ | - | |
| Previous years' population estimates (variance) | | | | | |
| 1994 | 230,411 wild ($2 \times 10^{10}$) 126,916 hatchery ($6 \times 10^8$) | 444,791 ($1 \times 10^{11}$) | 33,709 ($5 \times 10^8$) | 0 - | |
| 1993 | 212,788 wild ($5 \times 10^9$) 33,564 hatchery ($4 \times 10^8$) | 2,380 ($6 \times 10^6$) | 1,427 ($2 \times 10^6$) | 660 ($4 \times 10^5$) | |
| 1992 | No trawl performed due to low water | | | | |

[a] Weighted average based on number of transects in strata.

Table 2. Total length frequency (mm) and mean weight (g) of kokanee sampled by midwater trawling in Anderson Ranch Reservoir, June 1995.

| | Kokanee | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Length range (mm) | Age 0+ | | Age 1+ | | Age 2+ | | Age 3+ | |
| | no. | avg. wt. | no. | avg. wt. | no. | avg. wt. | no. | avg. wt. |
| 0-9 | | | | | | | | |
| 10-19 | | | | | | | | |
| 20-29 | | | | | | | | |
| 30-39 | | | | | | | | |
| 40-49 | 2 | 0.5 | | | | | | |
| 50-59 | | | | | | | | |
| 60-69 | | | | | | | | |
| 70-79 | | | | | | | | |
| 80-89 | | | | | | | | |
| 90-99 | | | | | | | | |
| 100-109 | | | | | | | | |
| 110-119 | | | | | | | | |
| 120-129 | | | | | | | | |
| 130-139 | | | 1 | 18.5 | | | | |
| 140-149 | | | 1 | 23.0 | | | | |
| 150-159 | | | 1 | 34.5 | | | | |
| 160-169 | | | 2 | 37.0 | | | | |
| 170-179 | | | 1 | 46.5 | | | | |
| 180-189 | | | 6 | 55.6 | | | | |
| 190-199 | | | 1 | 63.0 | | | | |
| 200-209 | | | | | | | | |
| 210-219 | | | | | 1 | 93.0 | | |
| 220-229 | | | | | 4 | 101.2 | | |
| 230-239 | | | | | 8 | 114.2 | | |
| 240-249 | | | | | 12 | 124.7 | | |
| 250-259 | | | | | 3 | 134.7 | | |
| 260-269 | | | | | | | | |
| 270-279 | | | | | | | | |
| 280-289 | | | | | | | | |
| 290-299 | | | | | | | | |
| Number: | 2 | | 13 | | 28 | | 0 | |
| Avg. length | 45 | | 170 | | 237 | | | |
| Total sampled: | 2 | | 13 | | 28 | | 0 | |

Table 3. Number of kokanee observed at selected sites on the South Fork Boise River, during spawning ground surveys, 1995.

| Location[a] | 8/14 | 8/23 | 8/31 | 9/7 | 9/15 | 9/21 | 9/29 | 10/4 |
|---|---|---|---|---|---|---|---|---|
| 1 | 25 | 100 | 400 | 205 | 200 | 100 | 1 | 0 |
| 2 | 0 | 10 | 16 | 43 | 21 | 0 | 4 | 0 |
| 3 | 3 | 20 | 96 | 198 | 60 | 74 | 85 | 30 |
| 4 | 0 | 35 | 59 | 86 | 110 | 80 | 75 | 60 |
| 5 | 0 | 0 | 0 | 5 | 5 | 9 | 0 | 0 |
| 6 | 0 | 64 | 147 | 179 | 120 | 100 | 110 | 35 |
| 7 | 0 | 15 | 110 | 276 | 250 | 73 | 35 | 0 |
| 8 | 0 | 19 | 53 | 60 | 8 | 30 | 0 | 0 |
| 9 | 0 | 22 | 106 | 257 | 200 | 230 | 28 | 8 |
| 10 | 0 | 20 | 350 | 855 | 550 | 350 | 150 | 0 |
| 11 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 12 | 0 | 4 | 30 | 126 | 47 | 56 | 25 | 20 |
| 13 | 0 | 0 | 0 | 48 | 45 | 5 | 65 | 28 |
| Total: | 28 | 309 | 1,367 | 2,339 | 1,616 | 1,107 | 578 | 181 |

[a] Site Descriptions:
1 - Trap site: NW1/4, NE1/4, Sec 30, T2N, R10E
2 - Prospect hole: NW1/4, NE1/4, Sec 18, T2N, R10E
3 - Johnson hole: SW1/4, NE1/4, Sec 5, T2N, R10E
4 - Paradise hole: SW1/4, NW1/4, Sec 33, T3N, R10E
5 - Trinity Creek: SE1/4, SW1/4, Sec 9, T3N, R10E
6 - Section 10 hole: SE1/4, NE1/4, Sec 10, T3N, R10E
7 - Chaparrel hole: NE1/4, NE1/4, Sec 12, T3N, R10E
8 - Ranger station hole: NE1/4, NE1/4, Sec 8, T3N, R11E
9 - Virginia Gulch Bridge: SE1/4, SE1/4, Sec 9, T3N, R11E
10 - Baumgartner hole: SE1/4, SE1/4, Sec 7, T3N, R12E
11 - Deadwood hole: NE1/4, NE1/4, Sec 22, T3N, R12E
12 - Big hole: SE1/4, SW1/4, Sec 18, T3N, R13E
13 - Smokey Creek hole: SE1/4, SW1/4, Sec 9, T3N, R13E

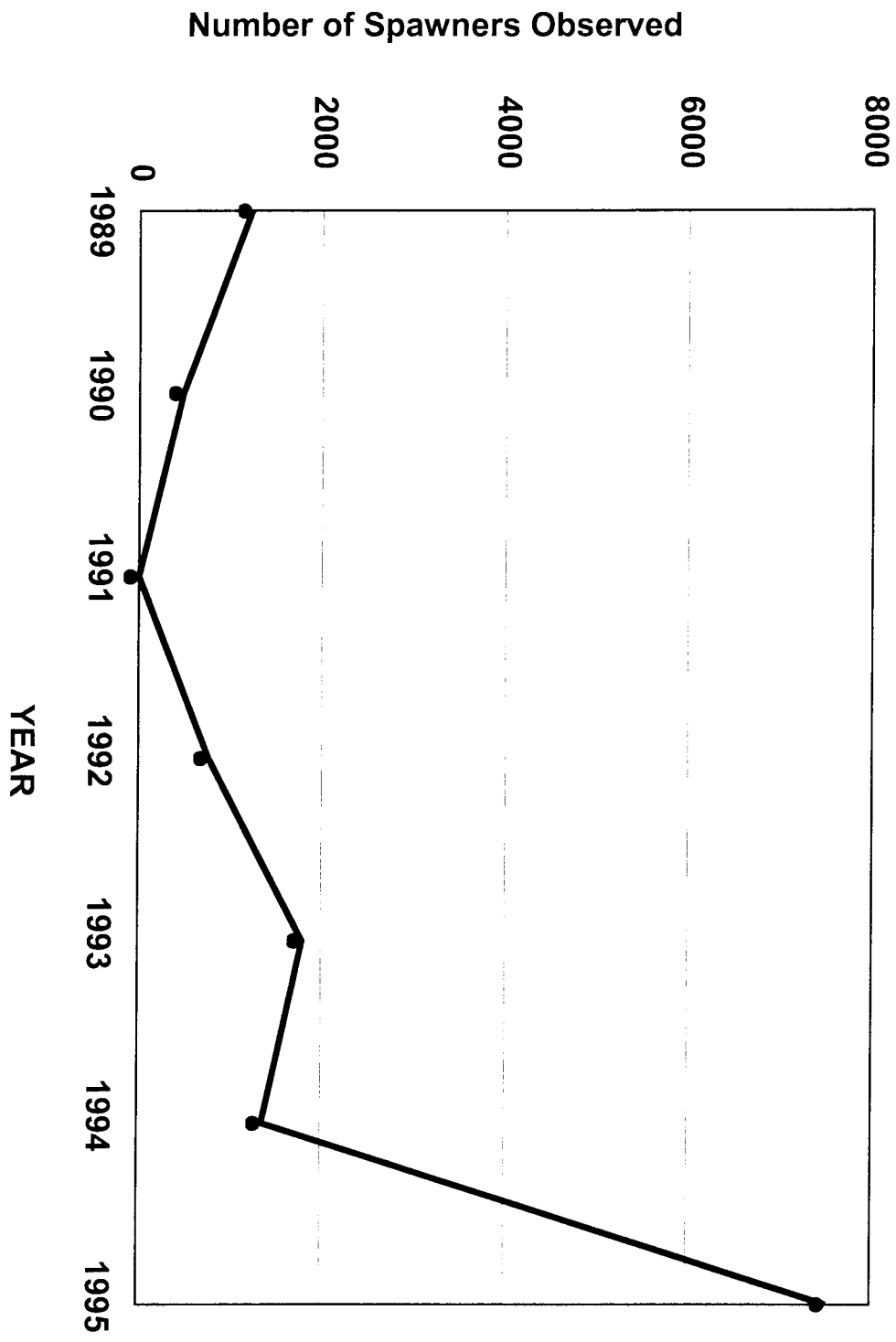


Figure 3. Total numbers of spawning kokanee observed at thirteen trend monitoring sites on the South Fork Boise River on a weekly basis during August, September and October from 1989 through 1995.

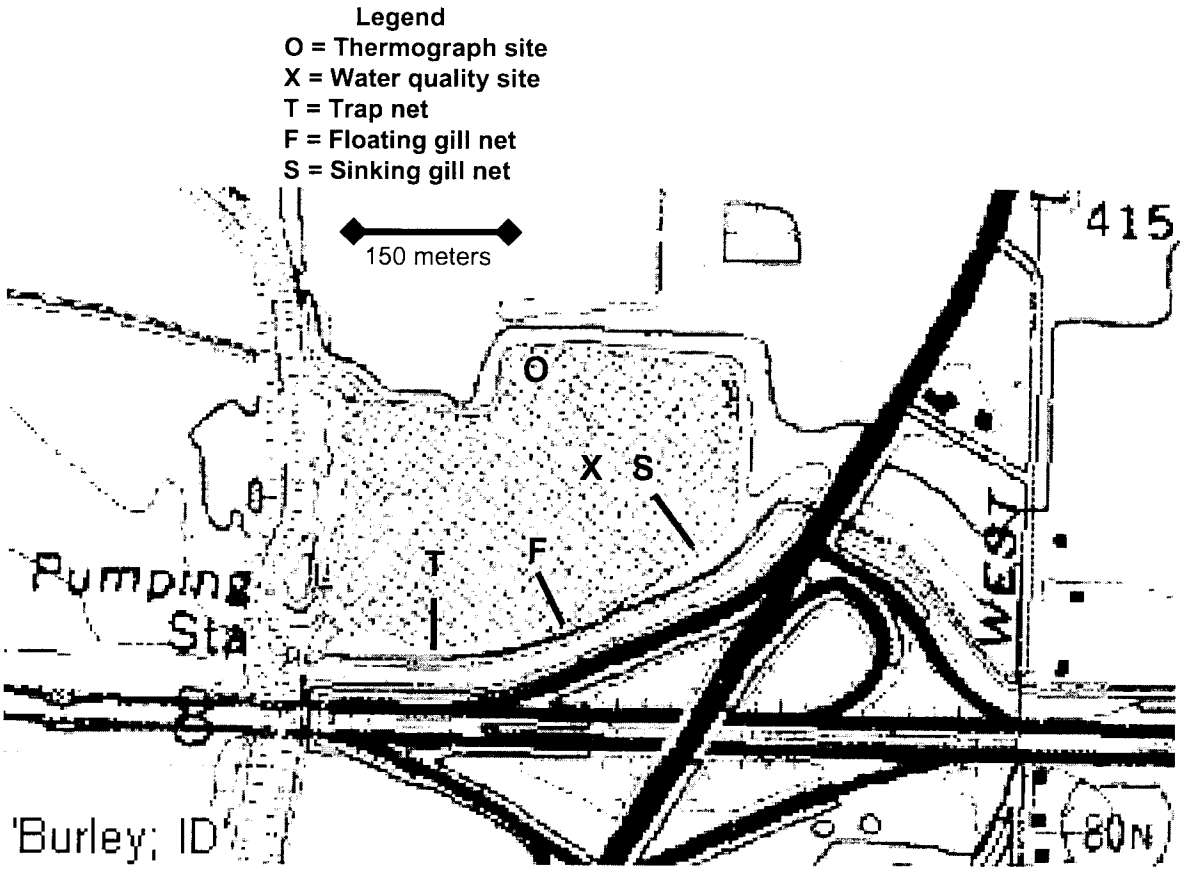


Figure 4. Map of the Burley gravel pit pond at the intersection of Interstate 84 (80N) and Highway 27. Locations of sites are depicted.

Table 4. Standardized lowland lakes fish sampling protocol results for the gravel pit pond north of Burley for July 30 and August 4, 1995.

| Largemouth bass | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 0-9 | | | | | | | | | | |
| 10-19 | | | | | | | | | | |
| 20-29 | | | | | | | | | | |
| 30-39 | | | | | | | | | | |
| 40-49 | | | | | | | | | | |
| 50-59 | | | | | | | | | | |
| 60-69 | | | | | | | | | | |
| 70-79 | | | | | | | | | | |
| 80-89 | | | | | | | | | | |
| 90-99 | | | | | | | | | | |
| 100-109 | | | | | | | 1 | 12.5 | 1 | 15 |
| 110-119 | | | | | | | 2 | 25.0 | 2 | 16 |
| 120-129 | | | | | | | 2 | 25.0 | 2 | 26 |
| 130-139 | | | | | | | 2 | 25.0 | 2 | 32 |
| 140-149 | | | | | | | | | | |
| 150-159 | | | | | | | | | | |
| 160-169 | | | | | | | | | | |
| 170-179 | | | | | | | | | | |
| 180-189 | | | | | | | | | | |
| 190-199 | | | | | | | | | | |
| 200-209 | | | | | | | | | | |
| 210-219 | | | | | | | | | | |
| 220-229 | | | | | | | | | | |
| 230-239 | | | | | | | | | | |
| 240-249 | | | | | | | 1 | 12.5 | 1 | 184 |
| Number: | 0 | | 0 | | 0 | | 8 | | | |
| Avg length: | | | | | | | 134 | | | |
| Total sampled: | 0 | | 0 | | 0 | | 8 | | | |

Table 4. Continued.

| | Black crappie | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 0-9 | | | | | | | | | | |
| 10-19 | | | | | | | | | | |
| 20-29 | | | | | | | | | | |
| 30-39 | | | | | | | 2 | 50.0 | | |
| 40-49 | | | | | | | | | | |
| 50-59 | | | | | | | | | | |
| 60-69 | | | | | | | | | | |
| 70-79 | | | | | | | | | | |
| 80-89 | | | | | | | 2 | 50.0 | 2 | 7 |
| 90-99 | | | | | | | | | | |
| 100-109 | | | | | 1 | 25.0 | | | 1 | 12 |
| 110-119 | | | | | 3 | 75.0 | | | 2 | 16 |
| 120-129 | | | | | | | | | | |
| 130-139 | | | | | | | | | | |
| 140-149 | | | | | | | | | | |
| 150-159 | | | | | | | | | | |
| 160-169 | | | | | | | | | | |
| 170-179 | | | | | | | | | | |
| 180-189 | | | | | | | | | | |
| 190-199 | | | | | | | | | | |
| 200-209 | | | | | | | | | | |
| 210-219 | | | | | | | | | | |
| 220-229 | | | | | | | | | | |
| 230-239 | | | | | | | | | | |
| 240-249 | | | 1 | 100.0 | | | | | 1 | 210 |
| Number: | 0 | | 1 | | 4 | | 4 | | | |
| Avg length: | | | 240 | | 111 | | 59 | | | |
| Total sampled: | 0 | | 1 | | 4 | | 4 | | | |

Table 4. Continued.

| Yellow perch | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 50-59 | | | | | | | 1 | 1.3 | | |
| 60-69 | | | | | | | | | | |
| 70-79 | | | | | | | | | | |
| 80-89 | | | | | | | | | | |
| 90-99 | | | | | 3 | 4.8 | | | 1 | 8 |
| 100-109 | | | | | 27 | 42.9 | 29 | 37.2 | 10 | 11 |
| 110-119 | 1 | 100.0 | 1 | 100.0 | 28 | 44.4 | 47 | 60.3 | 17 | 13 |
| 120-129 | | | | | 5 | 7.9 | 1 | 1.3 | 4 | 18 |
| 130-139 | | | | | | | | | | |
| 140-149 | | | | | | | | | | |
| 150-159 | | | | | | | | | | |
| 160-169 | | | | | | | | | | |
| 170-179 | | | | | | | | | | |
| 180-189 | | | | | | | | | | |
| 190-199 | | | | | | | | | | |
| Number: | 1 | | 1 | | 63 | | 78 | | | |
| Avg length: | 110 | | 115 | | 108 | | 108 | | | |
| Total sampled: | 1 | | 1 | | 63 | | 222 | | | |

Table 4. Continued.

| Common carp | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 0-9 / 150-159 | 1 | 33.3 | | | | | | | 1 | 48 |
| 160-169 | | | 1 | 16.7 | | | 2 | 100.0 | 1 | 50 |
| 170-179 | | | | | | | | | | |
| 180-189 | | | | | | | | | | |
| 190-199 | 1 | 33.3 | 1 | 16.7 | | | | | 1 | 70 |
| 200-209 | | | | | | | | | | |
| 210-219 | | | | | | | | | | |
| 220-229 | | | 1 | 16.7 | | | | | 1 | 120 |
| 230-239 | | | | | | | | | | |
| 240-249 | | | | | | | | | | |
| 250-259 / 490-499 | | | 1 | 16.7 | | | | | 1 | 1,600 |
| 500-509 | | | | | | | | | | |
| 510-519 | | | | | | | | | | |
| 520-529 | | | | | | | | | | |
| 530-539 | | | | | | | | | | |
| 540-549 | | | | | | | | | | |
| 550-559 | | | | | | | | | | |
| 560-569 | | | | | | | | | | |
| 570-579 | | | 1 | 16.7 | | | | | 1 | 2,300 |
| 580-589 | | | | | | | | | | |
| 590-599 | | | | | | | | | | |
| 600-609 | | | | | | | | | | |
| 610-619 | | | | | | | | | | |
| 620-629 | | | | | | | | | | |
| 630-639 | | | | | | | | | | |
| 640-649 | 1 | | 1 | 16.7 | | | | | 2 | 3,300 |
| Number: | 3 | | 6 | | 0 | | 2 | | | |
| Avg length: | 327 | | 380 | | | | 163 | | | |
| Total sampled: | 3 | | 6 | | 0 | | 2 | | | |

Table 4. Continued.

| Utah sucker | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 0-9 | | | | | | | | | | |
| / | | | | | | | | | | |
| 100-109 | | | | | | | | | | |
| 110-119 | | | | | | | | | | |
| 120-129 | | | | | | | 1 | 16.7 | | |
| 130-139 | | | | | | | 1 | 16.7 | | |
| 140-149 | 1 | 14.3 | | | | | 1 | 16.7 | 1 | 32 |
| 150-159 | 2 | 28.6 | | | | | 1 | 16.7 | 2 | 37 |
| 160-169 | | | | | | | 1 | 16.7 | | |
| 170-179 | | | | | | | | | | |
| 180-189 | | | | | | | 1 | 16.7 | | |
| 190-199 | | | | | | | | | | |
| 200-209 | | | | | | | | | | |
| 210-219 | | | 2 | 2.6 | | | | | 2 | 80 |
| 220-229 | | | | | | | | | | |
| 230-239 | | | | | | | | | | |
| 240-249 | | | 1 | 1.3 | | | | | 1 | 160 |
| 250-259 | | | 1 | 1.3 | | | | | 1 | 150 |
| 260-269 | | | | | | | | | | |
| 270-279 | | | | | | | | | | |
| 280-289 | | | 1 | 1.3 | | | | | 1 | 200 |
| 290-299 | | | | | | | | | | |
| 300-309 | | | | | | | | | | |
| 310-319 | | | 1 | 1.3 | | | | | 1 | 280 |
| 320-329 | | | 2 | 2.6 | | | | | 2 | 290 |
| 330-339 | | | | | | | | | | |
| 340-349 | | | 3 | 3.9 | | | | | 3 | 407 |
| 350-359 | | | 5 | 6.6 | | | | | 5 | 432 |
| 360-369 | | | 4 | 5.3 | | | | | 4 | 510 |
| 370-379 | 2 | 28.6 | 5 | 6.6 | | | | | 7 | 546 |
| 380-389 | 1 | 14.3 | 9 | 11.8 | | | | | 10 | 587 |
| 390-399 | | | 14 | 18.4 | | | | | 14 | 593 |
| 400-409 | | | 6 | 7.9 | | | | | 6 | 688 |
| 410-419 | | | 3 | 3.9 | | | | | 3 | 677 |
| 420-429 | | | 2 | 2.6 | | | | | 2 | 760 |
| 430-439 | | | | | | | | | | |
| 440-449 | | | | | | | | | | |
| 450-459 | | | 3 | 3.9 | | | | | 2 | 1,000 |
| 460-469 | | | 2 | 2.6 | | | | | 2 | 1,050 |
| 470-479 | | | 2 | 2.6 | | | | | 2 | 1,200 |
| 480-489 | | | 2 | 2.6 | | | | | 2 | 1,150 |
| 490-499 | | | 1 | 1.3 | | | | | 1 | 1,200 |
| 500-509 | | | 1 | 1.3 | | | | | 1 | 1,300 |
| 510-519 | 1 | 14.3 | 2 | 2.6 | | | | | 3 | 1,367 |
| 520-529 | | | 2 | 2.6 | | | | | 2 | 1,525 |
| 530-539 | | | | | | | | | | |
| 540-549 | | | 1 | 1.3 | | | | | 1 | 1,600 |
| 550-559 | | | 1 | 1.3 | | | | | 1 | 2,100 |
| 560-569 | | | | | | | | | | |
| 570-579 | | | | | | | | | | |
| 590-599 | | | | | | | | | | |
| Number: | 7 | | 76 | | 0 | | 6 | | | |
| Avg | 299 | | 395 | | | | 148 | | | |
| Total sampled: | 7 | | 76 | | 0 | | 6 | | | |

Table 4. Continued.

| | Brown bullhead | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 0-9 / 100-109 | | | | | | | | | | |
| 110-119 | | | | | | | | | | |
| 120-129 | | | | | | | | | | |
| 130-139 | | | | | | | | | | |
| 140-149 | | | | | | | | | | |
| 150-159 | | | | | | | | | | |
| 160-169 | | | | | | | | | | |
| 170-179 | | | | | | | | | | |
| 180-189 | | | | | | | | | | |
| 190-199 | 1 | 100.0 | | | | | | | 1 | 132 |
| 200-209 | | | | | | | | | | |
| 210-219 | | | | | | | | | | |
| 220-229 | | | | | | | | | | |
| 230-239 | | | | | | | | | | |
| 240-249 | | | | | | | | | | |
| Number: | 1 | | 0 | | 0 | | 0 | | | |
| Avg length: | 195 | | | | | | | | | |
| Total sampled: | 1 | | 0 | | 0 | | 0 | | | |

Table 4. Continued.

| | Channel catfish | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 0-9 / 200-209 | | | | | | | | | | |
| 210-219 | | | | | | | | | | |
| 220-229 | | | | | | | | | | |
| 230-239 | | | | | | | | | | |
| 240-249 | | | | | | | | | | |
| 250-259 | | | | | | | | | | |
| 260-269 | | | | | | | | | | |
| 270-279 | | | | | | | | | | |
| 280-289 | | | | | | | | | | |
| 290-299 | | | | | | | | | | |
| 300-309 | | | | | | | | | | |
| 310-319 | | | | | | | | | | |
| 320-329 | | | 1 | 100.0 | | | | | 1 | 300 |
| 330-339 | | | | | | | | | | |
| 340-349 | | | | | | | | | | |
| Number: | 0 | | 1 | | 0 | | 0 | | | |
| Avg | | | 320 | | | | | | | |
| Total sampled: | 0 | | 1 | | 0 | | 0 | | | |

Table 4. Continued.

| | Utah chub | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length range | Sinking gill net length | | Floating gill net length | | Frame net length | | Electrofishing length | | Average weight | |
| (mm) | no. | % | no. | % | no. | % | no. | % | no. | avg. |
| 0-9 | | | | | | | | | | |
| 10-19 | | | | | | | | | | |
| 20-29 | | | | | | | | | | |
| 30-39 | | | 1 | 2.9 | | | | | | |
| 40-49 | | | | | | | | | | |
| 50-59 | | | | | | | | | | |
| 60-69 | | | | | | | | | | |
| 70-79 | | | | | | | | | | |
| 80-89 | | | | | | | | | | |
| 90-99 | | | | | | | | | | |
| 100-109 | | | | | | | | | | |
| 110-119 | | | | | | | 3 | 21.4 | | |
| 120-129 | | | | | | | 9 | 64.3 | | |
| 130-139 | | | | | | | 1 | 7.1 | | |
| 140-149 | | | | | | | | | | |
| 150-159 | 1 | 50.0 | | | | | 1 | 7.1 | 1 | 44 |
| 160-169 | 1 | 50.0 | 2 | 5.9 | | | | | 3 | 83 |
| 170-179 | | | | | | | | | | |
| 180-189 | | | | | | | | | | |
| 190-199 | | | | | | | | | | |
| 200-209 | | | | | | | | | | |
| 210-219 | | | 1 | 2.9 | | | | | 1 | 100 |
| 220-229 | | | 8 | 23.5 | | | | | 8 | 118 |
| 230-239 | | | 7 | 20.6 | | | | | 7 | 130 |
| 240-249 | | | 4 | 11.8 | | | | | 4 | 145 |
| 250-259 | | | 5 | 14.7 | | | | | 5 | 164 |
| 260-269 | | | 3 | 8.8 | | | | | 3 | 180 |
| 270-279 | | | 3 | 8.8 | | | | | 3 | 213 |
| 280-289 | | | | | | | | | | |
| 290-299 | | | | | | | | | | |
| Number: | 2 | | 34 | | 0 | | 14 | | | |
| Avg | 160 | | 229 | | | | 124 | | | |
| Total sampled: | 2 | | 34 | | 0 | | 14 | | | |

thermograph was operated on the north side of the pond from June 2 to September 12, 1995. Temperatures were recorded every 48 minutes with the results summarized for daily mean, maximum, and minimum temperatures as well as a standard deviation for each day's temperatures (Table 5). Daily maximum temperatures exceeded 25°C several times throughout the summer, which surpasses the maximum threshold of tolerance of most trout species but is within the range of preferred temperatures for many warm water fish species. The highest temperature recorded was 27.5°C on July 28, 1995.

## Little Camas Reservoir

One floating and one sinking gill net were set in Little Camas Reservoir overnight on the afternoon of April 10, 1995. No fish were caught in either net indicating that a total fish kill may have been achieved with the rotenone project the previous fall (Warren and Partridge 1996).

## Lower Salmon Falls Reservoir

A total of 459 largemouth bass averaging 158 mm in total length and 144 bluegill *Lepomis macrochirus* averaging 49 mm in total length were electrofished from a small private pond west of the town of Hagerman and transplanted into Lower Salmon Falls Reservoir on the evenings of July 12 and August 10, 1995. All largemouth bass were marked with a left maxillary clip prior to releasing into Lower Salmon Falls Reservoir south of the upper power plant.

The reservoir was sampled by electrofishing with the Smith-Root electrofishing vessel on the evenings of October 20 and November 3, 1995. The purpose of the electrofishing was to investigate the distribution, occurrence and size structure of largemouth bass within the reservoir with the presence of previously marked transplanted fish noted. Only game fish were targeted for netting. Six shoreline sites were electrofished (Figure 5).

A total of 39 largemouth bass were sampled with 11 of them bearing a left maxillary clip indicating that they were transplanted from the private pond (Table 6). The average length of recaptured largemouth bass was 219 mm. Sites 5 and 6, which were the two uppermost sites on the reservoir and nearest the release site, had 10 of the 11 recaptured largemouth bass. The other recaptured largemouth bass was sampled from site 2, which is approximately 7.5 km down reservoir from its release site. There were also 57 bluegill, 1 yellow perch, 148 hatchery rainbow trout *O. mykiss*, 4 wild rainbow trout, and 1 brown trout *Salmo trutta* sampled from the six sites (Table 7). All but one bluegill was sampled from site 5 (Buckeye Cove).

Continuously recording thermographs were installed on the boat docks at Lower Salmon Dam and at the Bell Rapids access sites as well as in Buckeye Cove. The thermographs were programmed to record temperatures every 48 minutes from May 31 to September 12, 1995. Daily mean, maximum and minimum temperatures were calculated for each day (Tables 8-10).

Table 5. Daily temperature summaries for temperatures (°C) taken every 48 minutes at the Burley gravel pit pond in 1995.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 6/2/95 | 18.4 | 0.44 | 19.1 | 17.9 |
| 6/3/95 | 17.9 | 0.30 | 18.4 | 17.5 |
| 6/4/95 | 18.4 | 1.27 | 20.6 | 17.0 |
| 6/5/95 | 17.7 | 1.14 | 19.3 | 15.5 |
| 6/6/95 | 14.1 | 0.45 | 15.3 | 13.4 |
| 6/7/95 | 13.7 | 0.49 | 14.4 | 12.8 |
| 6/8/95 | 13.5 | 0.41 | 14.2 | 12.8 |
| 6/9/95 | 13.4 | 0.40 | 14.2 | 13.1 |
| 6/10/95 | 14.7 | 1.50 | 16.9 | 12.8 |
| 6/11/95 | 17.1 | 1.58 | 19.5 | 15.1 |
| 6/12/95 | 20.3 | 1.65 | 23.1 | 18.4 |
| 6/13/95 | 21.0 | 0.79 | 22.3 | 19.8 |
| 6/14/95 | 21.1 | 0.70 | 22.3 | 20.0 |
| 6/15/95 | 20.7 | 0.97 | 23.1 | 19.6 |
| 6/16/95 | 19.6 | 0.68 | 21.0 | 18.8 |
| 6/17/95 | 19.1 | 1.15 | 20.6 | 16.9 |
| 6/18/95 | 18.5 | 0.34 | 19.1 | 17.9 |
| 6/19/95 | 17.2 | 0.37 | 17.9 | 16.6 |
| 6/20/95 | 17.2 | 0.70 | 18.5 | 16.3 |
| 6/21/95 | 16.4 | 0.27 | 17.0 | 15.8 |
| 6/22/95 | 16.8 | 1.20 | 18.4 | 15.5 |
| 6/23/95 | 18.9 | 2.09 | 22.3 | 16.6 |
| 6/24/95 | 20.7 | 1.73 | 23.3 | 18.2 |
| 6/25/95 | 22.3 | 1.83 | 25.1 | 20.0 |
| 6/26/95 | 23.2 | 1.57 | 26.2 | 21.0 |
| 6/27/95 | 22.1 | 0.61 | 23.8 | 21.0 |
| 6/28/95 | 20.2 | 0.66 | 21.3 | 19.3 |
| 6/29/95 | 19.5 | 1.23 | 21.1 | 17.7 |
| 6/30/95 | 20.4 | 1.25 | 22.1 | 18.7 |
| 7/1/95 | 21.3 | 1.10 | 23.6 | 20.0 |
| 7/2/95 | 20.4 | 0.68 | 21.4 | 19.3 |
| 7/3/95 | 19.2 | 0.40 | 20.0 | 18.4 |
| 7/4/95 | 18.9 | 1.04 | 20.5 | 17.7 |
| 7/5/95 | 20.2 | 1.58 | 23.6 | 18.4 |
| 7/6/95 | 21.4 | 0.85 | 22.8 | 20.0 |
| 7/7/95 | 22.2 | 1.66 | 24.7 | 20.3 |
| 7/8/95 | 23.6 | 1.19 | 25.7 | 21.9 |
| 7/9/95 | 23.2 | 0.83 | 24.8 | 21.8 |
| 7/10/95 | 22.5 | 0.46 | 23.5 | 21.9 |
| 7/11/95 | 22.4 | 1.04 | 24.1 | 21.1 |
| 7/12/95 | 22.0 | 0.58 | 23.1 | 21.0 |
| 7/13/95 | 20.7 | 0.91 | 22.3 | 19.5 |
| 7/14/95 | 21.6 | 1.79 | 24.7 | 19.5 |
| 7/15/95 | 21.8 | 0.86 | 22.9 | 20.3 |
| 7/16/95 | 22.4 | 1.51 | 24.7 | 20.5 |
| 7/17/95 | 23.3 | 1.81 | 26.0 | 21.1 |
| 7/18/95 | 22.7 | 0.75 | 24.5 | 21.4 |
| 7/19/95 | 22.8 | 1.24 | 25.1 | 21.3 |

Table 5. Continued.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 7/20/95 | 23.1 | 1.76 | 25.5 | 21.1 |
| 7/21/95 | 23.2 | 1.00 | 24.7 | 21.6 |
| 7/22/95 | 22.5 | 0.71 | 23.6 | 21.4 |
| 7/23/95 | 22.1 | 0.89 | 23.5 | 21.0 |
| 7/24/95 | 22.5 | 0.79 | 23.5 | 21.1 |
| 7/25/95 | 22.9 | 1.28 | 25.4 | 21.3 |
| 7/26/95 | 22.3 | 0.66 | 24.0 | 21.6 |
| 7/27/95 | 22.5 | 1.50 | 24.8 | 20.8 |
| 7/28/95 | 24.0 | 1.86 | 27.5 | 21.8 |
| 7/29/95 | 24.2 | 0.86 | 26.2 | 22.6 |
| 7/30/95 | 20.8 | 0.60 | 22.1 | 20.0 |
| \ | NO DATA | | | |
| 8/3/95 | 23.1 | 1.85 | 26.6 | 20.8 |
| 8/4/95 | 23.6 | 1.14 | 25.4 | 21.6 |
| 8/5/95 | 24.0 | 1.55 | 26.9 | 21.9 |
| 8/6/95 | 24.5 | 1.16 | 26.0 | 22.6 |
| 8/7/95 | 23.9 | 0.75 | 25.0 | 22.1 |
| 8/8/95 | 20.3 | 0.62 | 21.9 | 19.5 |
| 8/9/95 | 19.8 | 0.68 | 21.0 | 18.8 |
| 8/10/95 | 20.9 | 1.48 | 23.8 | 19.3 |
| 8/11/95 | 20.7 | 0.83 | 22.3 | 19.5 |
| 8/12/95 | 21.0 | 1.39 | 23.3 | 19.3 |
| 8/13/95 | 20.0 | 0.97 | 22.3 | 18.7 |
| 8/14/95 | 20.0 | 1.48 | 22.3 | 18.0 |
| 8/15/95 | 20.9 | 1.47 | 23.6 | 19.0 |
| 8/16/95 | 21.3 | 0.88 | 22.9 | 19.6 |
| 8/17/95 | 20.2 | 0.50 | 21.3 | 19.5 |
| 8/18/95 | 19.5 | 0.86 | 21.0 | 18.4 |
| 8/19/95 | 19.5 | 0.87 | 21.0 | 18.2 |
| 8/20/95 | 20.0 | 1.16 | 22.3 | 18.5 |
| 8/21/95 | 20.8 | 0.71 | 22.1 | 19.6 |
| 8/22/95 | 20.7 | 0.97 | 22.6 | 19.5 |
| 8/23/95 | 21.3 | 1.19 | 23.8 | 20.1 |
| 8/24/95 | 21.3 | 0.70 | 22.3 | 20.5 |
| 8/25/95 | 21.7 | 1.04 | 23.5 | 20.3 |
| 8/26/95 | 22.2 | 0.91 | 23.5 | 20.6 |
| 8/27/95 | 22.2 | 1.01 | 23.6 | 20.6 |
| 8/28/95 | 22.4 | 1.05 | 24.1 | 20.8 |
| 8/29/95 | 21.4 | 0.59 | 22.9 | 20.6 |
| 8/30/95 | 21.0 | 1.08 | 22.9 | 19.6 |
| 8/31/95 | 21.0 | 0.66 | 21.9 | 19.8 |
| 9/1/95 | 21.4 | 1.42 | 24.0 | 20.0 |
| 9/2/95 | 21.5 | 0.70 | 23.1 | 20.6 |
| 9/3/95 | 21.2 | 0.92 | 22.9 | 20.0 |
| 9/4/95 | 20.4 | 0.44 | 21.3 | 19.5 |
| 9/5/95 | 19.9 | 0.75 | 21.0 | 18.8 |
| 9/6/95 | 19.9 | 0.77 | 21.4 | 18.7 |
| 9/7/95 | 19.5 | 0.54 | 20.5 | 18.5 |
| 9/8/95 | 18.5 | 0.43 | 19.1 | 17.7 |
| 9/9/95 | 18.7 | 1.02 | 21.0 | 17.5 |
| 9/10/95 | 18.9 | 0.95 | 20.6 | 17.5 |
| 9/11/95 | 18.8 | 0.94 | 20.3 | 17.4 |
| 9/12/95 | 19.0 | 1.18 | 20.8 | 17.2 |

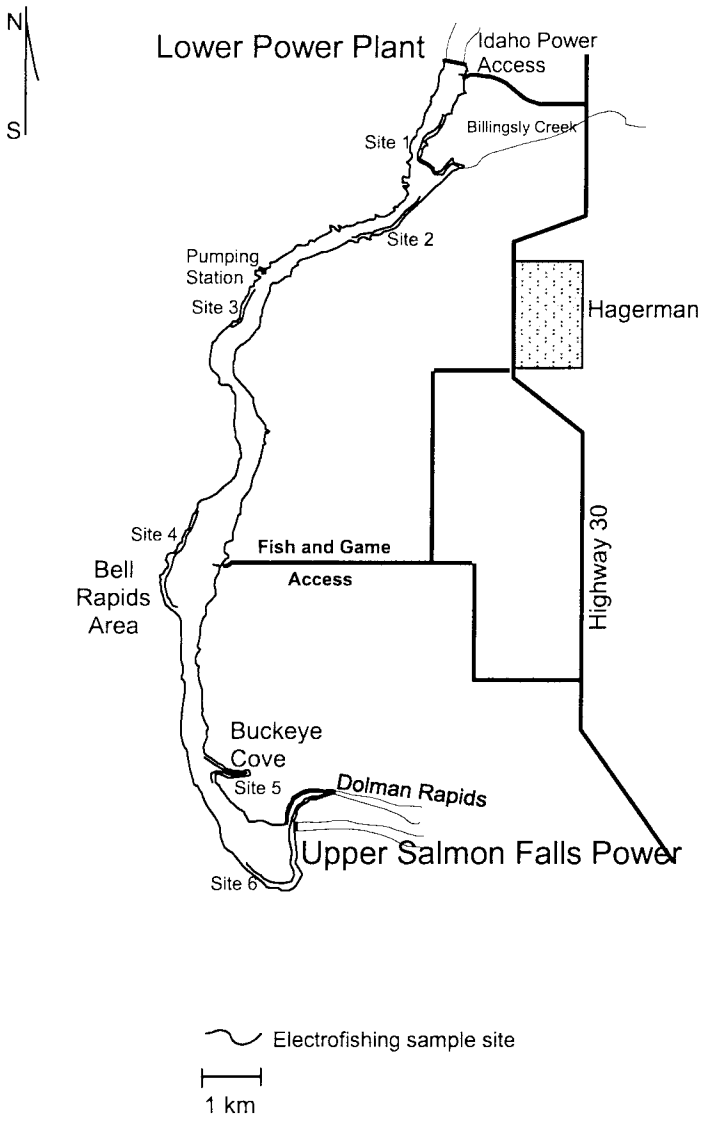


Figure 5. Map of Lower Salmon Falls Reservoir depicting electrofishing sampling sites, 1995.

Table 6. Total length frequencies (mm) and average weights (g) of all largemouth bass sampled by electrofishing six sites at Lower Salmon Falls Reservoir on October 20 and November 10, 1995. Numbers in parentheses are numbers of fish in sample that had a left maxillary clip.

| Length range (mm) | Site 6 | | Site 5 | | Site 4 | | Site 3 | | Site 2 | | Site 1 | | Average weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | no. | % | no. | % | no. | % | no. | % | no. | % | no. | % | |
| 0-9 | | | | | | | | | | | | | |
| 10-19 | | | | | | | | | | | | | |
| 20-29 | | | | | | | | | | | | | |
| 30-39 | | | | | | | | | | | | | |
| 40-49 | | | | | | | | | | | | | |
| 50-59 | | | | | | | | | | | | | |
| 60-69 | | | | | | | | | | | | | |
| 70-79 | | | 2 | 13.3 | | | | | | | | | 5 |
| 80-89 | | | 1 | 6.7 | | | | | | | | | 10 |
| 90-99 | | | | | | | | | | | | | |
| 100-109 | | | 3 | 20.0 | | | | | | | | | 14 |
| 110-119 | | | | | | | | | | | | | |
| 120-129 | | | | | | | | | | | | | |
| 130-139 | | | | | | | | | | | | | |
| 140-149 | | | | | | | | | | | | | |
| 150-159 | | | | | | | | | | | | | |
| 160-169 | 1 (1) | 6.3 | 1 | 6.7 | | | | | | | | | 57 |
| 170-179 | | | | | | | | | | | | | |
| 180-189 | 1 | 6.3 | | | | | | | | | | | 94 |
| 190-199 | 1 (1) | 6.3 | 1 | 6.7 | | | | | | | | | 95 |
| 200-209 | 2 | 12.5 | | | 2 | 28.6 | | | | | | | 116 |
| 210-219 | 1 (1) | 6.3 | | | 1 | 14.3 | | | | | | | 121 |
| 220-229 | 5 (3) | 31.3 | 2 (1) | 13.3 | | | | | 1 (1) | 100.0 | | | 141 |
| 230-239 | | | 2 (1) | 13.3 | 1 | 14.3 | | | | | | | 179 |
| 240-249 | | | 1 (1) | 6.7 | | | | | | | | | 174 |
| 250-259 | | | 1 (1) | 6.7 | 2 | 28.6 | | | | | | | 222 |
| 260-269 | | | | | | | | | | | | | |
| 270-279 | 2 | 12.5 | 1 | 6.7 | | | | | | | | | 297 |
| 280-289 | | | | | | | | | | | | | |
| 290-299 | | | | | | | | | | | | | |
| 300-309 | 1 | 6.3 | | | | | | | | | | | 480 |
| 310-319 | | | | | | | | | | | | | |
| 320-329 | | | | | | | | | | | | | |
| 330-339 | | | | | | | | | | | | | |

Table 6. Continued.

| Length range (mm) | Site 6 | | Site 5 | | Site 4 | | Site 3 | | Site 2 | | Site 1 | | Average weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | no. | % | no. | % | no. | % | no. | % | no. | % | no. | % | |
| 340-349 | 1 | 6.3 | | | | | | | | | | | 780 |
| 350-359 | | | | | | | | | | | | | |
| 360-369 | | | | | | | | | | | | | |
| 370-379 | | | | | | | | | | | | | |
| 380-389 | | | | | | | | | | | | | |
| 390-399 | | | | | | | | | | | | | |
| 400-409 | | | | | | | | | | | | | |
| 410-419 | | | | | | | | | | | | | |
| 420-429 | | | | | | | | | | | | | |
| 430-439 | | | | | 1 | 14.3 | | | | | | | 1,850 |
| 440-449 | | | | | | | | | | | | | |
| 450-459 | | | | | | | | | | | | | |
| 460-469 | | | | | | | | | | | | | |
| 470-479 | | | | | | | | | | | | | |
| 480-489 | 1 | 6.3 | | | | | | | | | | | 2,250 |
| 490-499 | | | | | | | | | | | | | |
| Number: | 16 | | 15 | | 7 | | 0 | | 1 | | 0 | | |
| Avg. length: | 219 | | 172 | | 255 | | | | 220 | | | | |
| Not measured: | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | |

Table 7. Fish sampled by electrofishing six sites at Lower Salmon Falls Reservoir in October and November 1995. Total length frequency (mm) and mean weight (g) of some fish sampled are given.

| Length range (mm) | Hatchery rainbow trout | | | | Wild rainbow trout | | | | Brown trout | | | | Bluegill | | Yellow perch | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Weight | | Length | | Weight | | Length | | Weight | | Length | | Length | |
| | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | % |
| 0-9 | | | | | | | | | | | | | | | | |
| 10-19 | | | | | | | | | | | | | | | | |
| 20-29 | | | | | | | | | | | | | | | | |
| 30-39 | | | | | | | | | | | | | | | | |
| 40-49 | | | | | | | | | | | | | | | | |
| 50-59 | | | | | | | | | | | | | 2 | 3.5 | | |
| 60-69 | | | | | | | | | | | | | 1 | 1.8 | | |
| 70-79 | | | | | | | | | | | | | 16 | 28.1 | | |
| 80-89 | | | | | | | | | | | | | 22 | 38.6 | | |
| 90-99 | | | | | | | | | | | | | 13 | 22.8 | | |
| 100-109 | | | | | 1 | 25.0 | | | | | | | 1 | 1.8 | | |
| 110-119 | 2 | 1.4 | | | | | | | | | | | 1 | 1.8 | | |
| 120-129 | | | | | | | | | | | | | | | | |
| 130-139 | | | | | | | | | | | | | | | | |
| 140-149 | | | | | | | | | | | | | | | | |
| 150-159 | 3 | 2.0 | | | | | | | | | | | | | | |
| 160-169 | 1 | 0.7 | | | 1 | 25.0 | | | | | | | 1 | 1.8 | | |
| 170-179 | 9 | 6.1 | 1 | 62 | | | | | | | | | | | | |
| 180-189 | 10 | 6.8 | | | | | | | | | | | | | 1 | 100.0 |
| 190-199 | 28 | 18.9 | 2 | 75 | | | | | | | | | | | | |
| 200-209 | 30 | 20.3 | 7 | 95 | | | | | | | | | | | | |
| 210-219 | 23 | 15.5 | | | | | | | | | | | | | | |
| 220-229 | 18 | 12.2 | 1 | 150 | 1 | 25.0 | 1 | 112 | | | | | | | | |
| 230-239 | 7 | 4.7 | | | | | | | | | | | | | | |
| 240-249 | 5 | 3.4 | | | | | | | | | | | | | | |

Table 7. Continued.

| Length range (mm) | Hatchery rainbow trout | | | | Wild rainbow trout | | | | Brown trout | | | | Bluegill | | Yellow perch | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Weight | | Length | | Weight | | Length | | Weight | | Length | | Length | |
| | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | % |
| 250-259 | 3 | 2.0 | 1 | 160 | | | | | | | | | | | | |
| 260-269 | 1 | 0.7 | | | | | | | | | | | | | | |
| 270-279 | 4 | 2.7 | | | | | | | | | | | | | | |
| 280-289 | 1 | 0.7 | | | | | | | | | | | | | | |
| 290-299 | 1 | 0.7 | | | | | | | | | | | | | | |
| 300-309 | 1 | 0.7 | | | | | | | | | | | | | | |
| 310-319 | | | | | | | | | | | | | | | | |
| 320-329 | | | | | | | | | | | | | | | | |
| 330-339 | | | | | | | | | | | | | | | | |
| 340-349 | | | | | | | | | | | | | | | | |
| 350-359 | | | | | | | | | | | | | | | | |
| 360-369 | | | | | | | | | | | | | | | | |
| 370-379 | | | | | | | | | | | | | | | | |
| 380-389 | | | | | | | | | | | | | | | | |
| 390-399 | | | | | | | | | 1 | 100.0 | 1 | 670 | | | | |
| 400-409 | | | | | | | | | | | | | | | | |
| 410-419 | 1 | 0.7 | | | | | | | | | | | | | | |
| 420-429 | | | | | | | | | | | | | | | | |
| 430-439 / 480-489 | | | | | 1 | 25.0 | 1 | 1,300 | | | | | | | | |
| 490-499 | | | | | | | | | | | | | | | | |
| Number: | 148 | | | | 4 | | | | 1 | | | | 57 | | 1 | |
| Avg length: | 208 | | | | 244 | | | | 395 | | | | 83 | | 180 | |
| Total sampled: | 148 | | | | 4 | | | | 1 | | | | 57 | | 1 | |

Table 8. Daily temperature summaries for temperatures (°C) taken every 48 minutes at Idaho Power Company's Lower Salmon Dam Reservoir access site in 1995.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 6/1/95 | 16.4 | 0.24 | 16.7 | 15.9 |
| 6/2/95 | 16.6 | 0.19 | 16.9 | 16.3 |
| 6/3/95 | 16.8 | 0.14 | 17.0 | 16.6 |
| 6/4/95 | 16.7 | 0.23 | 17.0 | 16.3 |
| 6/5/95 | 17.0 | 0.21 | 17.5 | 16.7 |
| 6/6/95 | 17.1 | 0.51 | 17.7 | 16.1 |
| 6/7/95 | 14.9 | 0.44 | 15.9 | 14.5 |
| 6/8/95 | 14.4 | 0.14 | 14.5 | 14.2 |
| 6/9/95 | 13.8 | 0.42 | 14.5 | 13.3 |
| 6/10/95 | 13.7 | 0.40 | 14.4 | 13.4 |
| 6/11/95 | 14.5 | 0.49 | 15.3 | 13.9 |
| 6/12/95 | 15.2 | 0.53 | 16.3 | 14.7 |
| 6/13/95 | 16.1 | 0.58 | 17.2 | 15.5 |
| 6/14/95 | 16.9 | 0.45 | 17.7 | 16.4 |
| 6/15/95 | 17.1 | 0.30 | 17.7 | 16.7 |
| 6/16/95 | 17.1 | 0.11 | 17.2 | 16.9 |
| 6/17/95 | 17.0 | 0.11 | 17.2 | 16.7 |
| 6/18/95 | 17.1 | 0.23 | 17.7 | 16.9 |
| 6/19/95 | 17.3 | 0.13 | 17.7 | 17.2 |
| 6/20/95 | 17.1 | 0.21 | 17.4 | 16.7 |
| 6/21/95 | 16.7 | 0.17 | 17.0 | 16.4 |
| 6/22/95 | 15.9 | 0.32 | 16.4 | 15.5 |
| 6/23/95 | 15.7 | 0.45 | 16.4 | 15.3 |
| 6/24/95 | 16.9 | 0.37 | 17.5 | 16.4 |
| 6/25/95 | 17.7 | 0.21 | 18.2 | 17.4 |
| 6/26/95 | 18.2 | 0.23 | 18.7 | 17.9 |
| 6/27/95 | 18.8 | 0.16 | 19.0 | 18.5 |
| 6/28/95 | 18.9 | 0.17 | 19.1 | 18.5 |
| 6/29/95 | 18.7 | 0.28 | 19.0 | 18.0 |
| 6/30/95 | 18.7 | 0.22 | 19.0 | 18.4 |
| 7/1/95 | 18.5 | 0.17 | 18.8 | 18.2 |
| 7/2/95 | 18.8 | 0.17 | 19.1 | 18.5 |
| 7/3/95 | 18.5 | 0.19 | 19.0 | 18.2 |
| 7/4/95 | 18.0 | 0.23 | 18.4 | 17.7 |
| 7/5/95 | 17.8 | 0.18 | 18.2 | 17.5 |
| 7/6/95 | 18.3 | 0.73 | 19.5 | 17.5 |
| 7/7/95 | 18.8 | 0.38 | 19.5 | 18.4 |
| 7/8/95 | 19.3 | 0.69 | 20.3 | 18.5 |
| 7/9/95 | 19.9 | 0.51 | 20.8 | 19.1 |
| 7/10/95 | 19.7 | 0.25 | 20.1 | 19.3 |
| 7/11/95 | 19.6 | 0.36 | 20.3 | 19.1 |
| 7/12/95 | 19.5 | 0.45 | 20.5 | 19.0 |
| 7/13/95 | 19.6 | 0.43 | 20.5 | 19.1 |
| 7/14/95 | 19.9 | 1.63 | 23.8 | 18.8 |

Table 8. Continued.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 7/15/95 | 21.3 | 0.73 | 22.4 | 20.1 |
| \ | NO DATA | | | |
| 7/21/95 | 19.6 | 0.37 | 20.5 | 19.3 |
| 7/22/95 | 19.3 | 0.30 | 20.0 | 19.1 |
| 7/23/95 | 19.6 | 0.47 | 20.5 | 19.0 |
| 7/24/95 | 19.8 | 0.48 | 20.5 | 19.1 |
| 7/25/95 | 19.8 | 0.52 | 20.5 | 19.1 |
| 7/26/95 | 19.8 | 0.37 | 20.5 | 19.3 |
| 7/27/95 | 19.6 | 0.47 | 20.3 | 19.1 |
| 7/28/95 | 19.8 | 0.52 | 20.6 | 19.1 |
| 7/29/95 | 19.7 | 0.24 | 20.3 | 19.3 |
| 7/30/95 | 18.6 | 0.29 | 19.1 | 17.9 |
| 7/31/95 | 18.1 | 0.47 | 18.8 | 17.5 |
| 8/1/95 | 18.5 | 0.49 | 19.3 | 18.0 |
| 8/2/95 | 18.9 | 0.48 | 19.6 | 18.4 |
| 8/3/95 | 19.3 | 0.56 | 20.1 | 18.7 |
| 8/4/95 | 19.6 | 0.51 | 20.5 | 19.0 |
| 8/5/95 | 19.9 | 0.51 | 20.8 | 19.3 |
| 8/6/95 | 20.1 | 0.47 | 21.0 | 19.5 |
| 8/7/95 | 19.8 | 0.29 | 20.5 | 19.5 |
| 8/8/95 | 18.8 | 0.29 | 19.3 | 18.0 |
| 8/9/95 | 18.1 | 0.37 | 18.7 | 17.7 |
| 8/10/95 | 18.4 | 0.48 | 19.3 | 17.9 |
| 8/11/95 | 18.3 | 0.31 | 19.0 | 18.0 |
| 8/12/95 | 18.4 | 0.51 | 19.3 | 17.9 |
| 8/13/95 | 18.0 | 0.27 | 18.5 | 17.4 |
| 8/14/95 | 17.7 | 0.52 | 18.7 | 17.2 |
| 8/15/95 | 18.2 | 0.55 | 19.1 | 17.5 |
| 8/16/95 | 18.4 | 0.45 | 19.3 | 18.0 |
| 8/17/95 | 18.4 | 0.25 | 18.8 | 17.9 |
| 8/18/95 | 17.7 | 0.23 | 18.2 | 17.4 |
| 8/19/95 | 17.8 | 0.40 | 18.4 | 17.4 |
| 8/20/95 | 17.8 | 0.42 | 18.4 | 17.4 |
| 8/21/95 | 18.3 | 0.52 | 19.3 | 17.7 |
| 8/22/95 | 18.8 | 0.36 | 19.5 | 18.4 |
| 8/23/95 | 18.9 | 0.17 | 19.3 | 18.7 |
| 8/24/95 | 18.8 | 0.21 | 19.5 | 18.7 |
| 8/25/95 | 18.8 | 0.34 | 19.5 | 18.5 |
| 8/26/95 | 19.0 | 0.38 | 19.8 | 18.7 |
| 8/27/95 | 18.7 | 0.29 | 19.3 | 18.5 |
| 8/28/95 | 18.6 | 0.29 | 19.1 | 18.4 |
| 8/29/95 | 18.5 | 0.24 | 19.0 | 18.0 |
| 8/30/95 | 18.2 | 0.40 | 19.0 | 17.9 |

Table 8. Continued.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 8/31/95 | 18.3 | 0.41 | 19.0 | 17.9 |
| 9/1/95 | 18.4 | 0.42 | 19.1 | 17.9 |
| 9/2/95 | 18.4 | 0.27 | 18.8 | 18.0 |
| 9/3/95 | 18.5 | 0.28 | 19.1 | 18.2 |
| 9/4/95 | 18.5 | 0.12 | 18.8 | 18.4 |
| 9/5/95 | 18.5 | 0.19 | 18.8 | 18.2 |
| 9/6/95 | 18.0 | 0.15 | 18.7 | 17.9 |
| 9/7/95 | 18.0 | 0.24 | 18.4 | 17.5 |
| 9/8/95 | 17.4 | 0.22 | 17.7 | 16.9 |
| 9/9/95 | 17.1 | 0.27 | 17.9 | 16.9 |
| 9/10/95 | 17.0 | 0.21 | 17.5 | 16.7 |
| 9/11/95 | 17.1 | 0.31 | 17.7 | 16.7 |
| 9/12/95 | 17.5 | 1.72 | 22.4 | 16.9 |

Table 9. Daily temperature summaries for temperatures (°C) taken every 48 minutes at the Bell Rapids access boat dock at Lower Salmon Falls Reservoir in 1995.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 5/31/95 | 16.5 | 0.60 | 17.7 | 15.6 |
| 6/1/95 | 16.7 | 0.46 | 17.5 | 16.1 |
| 6/2/95 | 16.7 | 0.29 | 17.0 | 16.1 |
| 6/3/95 | 17.0 | 0.97 | 18.7 | 15.6 |
| 6/4/95 | 17.2 | 0.56 | 17.9 | 16.3 |
| 6/5/95 | 16.5 | 1.01 | 17.9 | 14.5 |
| 6/6/95 | 14.3 | 0.70 | 15.5 | 13.1 |
| 6/7/95 | 14.0 | 0.75 | 15.0 | 13.0 |
| 6/8/95 | 13.5 | 0.26 | 14.2 | 13.1 |
| 6/9/95 | 13.9 | 0.72 | 15.0 | 13.1 |
| 6/10/95 | 14.7 | 0.97 | 15.9 | 13.3 |
| 6/11/95 | 15.8 | 0.97 | 17.0 | 14.5 |
| 6/12/95 | 16.7 | 1.02 | 18.2 | 15.3 |
| 6/13/95 | 17.3 | 0.95 | 18.5 | 15.9 |
| 6/14/95 | 17.2 | 0.48 | 18.2 | 16.4 |
| 6/15/95 | 17.2 | 0.65 | 18.7 | 16.4 |
| 6/16/95 | 17.0 | 0.53 | 17.9 | 16.1 |
| 6/17/95 | 17.2 | 0.72 | 19.3 | 16.3 |
| 6/18/95 | 17.2 | 0.37 | 17.9 | 16.6 |
| 6/19/95 | 16.9 | 0.76 | 18.5 | 15.8 |
| 6/20/95 | 16.4 | 0.94 | 17.9 | 14.7 |
| 6/21/95 | 15.2 | 0.49 | 16.1 | 14.4 |
| 6/22/95 | 15.9 | 1.09 | 17.4 | 14.5 |
| 6/23/95 | 17.1 | 0.70 | 18.0 | 16.1 |
| 6/24/95 | 17.7 | 0.64 | 18.7 | 16.7 |
| 6/25/95 | 18.3 | 0.64 | 19.3 | 17.4 |
| 6/26/95 | 18.9 | 0.47 | 19.8 | 18.0 |
| 6/27/95 | 19.0 | 0.82 | 20.3 | 17.9 |
| 6/28/95 | 18.2 | 1.24 | 19.5 | 16.1 |
| 6/29/95 | 18.5 | 0.42 | 19.1 | 17.7 |
| 6/30/95 | 18.3 | 0.53 | 19.0 | 17.4 |
| 7/1/95 | 18.6 | 0.49 | 19.6 | 17.9 |
| 7/2/95 | 18.4 | 0.48 | 19.5 | 17.7 |
| 7/3/95 | 17.8 | 0.60 | 18.8 | 16.9 |
| 7/4/95 | 17.5 | 1.07 | 19.3 | 15.9 |
| 7/5/95 | 17.9 | 0.48 | 19.0 | 17.2 |
| 7/6/95 | 18.6 | 0.27 | 19.0 | 18.0 |
| 7/7/95 | 18.8 | 0.32 | 19.6 | 18.4 |
| 7/8/95 | 19.5 | 0.51 | 20.6 | 18.8 |
| 7/9/95 | 19.4 | 0.36 | 20.3 | 18.8 |
| 7/10/95 | 19.3 | 0.25 | 19.6 | 18.8 |
| 7/11/95 | 19.3 | 0.43 | 20.5 | 18.7 |
| 7/12/95 | 19.5 | 0.65 | 21.1 | 18.4 |
| 7/13/95 | 19.7 | 2.74 | 25.7 | 16.7 |
| 7/14/95 | 21.4 | 0.88 | 23.1 | 20.0 |
| \ | NO DATA | | | |
| 7/21/95 | 19.4 | 0.55 | 21.0 | 18.7 |
| 7/22/95 | 19.5 | 0.83 | 21.0 | 18.4 |
| 7/23/95 | 19.5 | 0.69 | 20.5 | 18.4 |
| 7/24/95 | 19.6 | 0.38 | 20.0 | 18.8 |

Table 9. Continued.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 7/25/96 | 19.3 | 0.43 | 20.0 | 18.5 |
| 5/31/95 | 16.5 | 0.60 | 17.7 | 15.6 |
| 7/26/95 | 19.4 | 0.49 | 20.1 | 18.5 |
| 7/27/95 | 19.2 | 0.50 | 20.0 | 18.4 |
| 7/28/95 | 19.4 | 0.53 | 20.3 | 18.5 |
| 7/29/95 | 19.5 | 0.36 | 20.0 | 18.4 |
| 7/30/95 | 17.9 | 1.07 | 19.6 | 16.3 |
| 7/31/95 | 17.5 | 0.92 | 18.7 | 16.3 |
| 8/1/95 | 18.0 | 0.81 | 19.1 | 16.7 |
| 8/2/95 | 18.8 | 0.79 | 20.0 | 17.5 |
| 8/3/95 | 19.0 | 0.51 | 19.6 | 18.0 |
| 8/4/95 | 19.3 | 0.47 | 20.1 | 18.5 |
| 8/5/95 | 19.5 | 0.45 | 20.1 | 18.7 |
| 8/6/95 | 19.7 | 0.44 | 20.3 | 18.8 |
| 8/7/95 | 19.4 | 0.59 | 20.6 | 18.4 |
| 8/8/95 | 17.9 | 0.84 | 19.0 | 16.4 |
| 8/9/95 | 17.7 | 0.84 | 19.0 | 16.4 |
| 8/10/95 | 18.3 | 0.57 | 19.3 | 17.4 |
| 8/11/95 | 17.8 | 1.11 | 19.5 | 15.9 |
| 8/12/95 | 18.1 | 0.74 | 19.1 | 16.9 |
| 8/13/95 | 17.3 | 0.81 | 18.5 | 15.8 |
| 8/14/95 | 17.2 | 0.86 | 18.4 | 15.9 |
| 8/15/95 | 17.8 | 0.74 | 18.8 | 16.6 |
| 8/16/95 | 18.1 | 0.57 | 19.1 | 17.2 |
| 8/17/95 | 17.9 | 0.62 | 19.1 | 17.0 |
| 8/18/95 | 16.9 | 1.19 | 18.4 | 15.1 |
| 8/19/95 | 17.2 | 0.79 | 18.2 | 15.8 |
| 8/20/95 | 17.6 | 0.80 | 18.5 | 16.3 |
| 8/21/95 | 18.3 | 0.62 | 19.3 | 17.4 |
| 8/22/95 | 18.7 | 0.40 | 19.5 | 18.0 |
| 8/23/95 | 18.8 | 0.25 | 19.3 | 18.5 |
| 8/24/95 | 18.7 | 0.49 | 19.6 | 17.9 |
| 8/25/95 | 18.5 | 0.66 | 19.5 | 17.2 |
| 8/26/95 | 18.8 | 0.67 | 20.1 | 17.7 |
| 8/27/95 | 18.4 | 0.70 | 19.3 | 17.2 |
| 8/28/95 | 18.2 | 0.68 | 19.0 | 16.9 |
| 8/29/95 | 18.1 | 0.81 | 19.0 | 16.4 |
| 8/30/95 | 17.7 | 0.78 | 19.0 | 16.4 |
| 8/31/95 | 17.7 | 0.82 | 19.0 | 16.4 |
| 9/1/95 | 18.1 | 0.71 | 19.1 | 17.0 |
| 9/2/95 | 18.4 | 0.53 | 19.1 | 17.4 |
| 9/3/95 | 18.5 | 0.27 | 18.8 | 18.0 |
| 9/4/95 | 18.5 | 0.16 | 18.8 | 18.2 |
| 9/5/95 | 18.3 | 0.61 | 19.1 | 17.4 |
| 9/6/95 | 17.9 | 0.60 | 18.7 | 16.9 |
| 9/7/95 | 17.7 | 0.67 | 18.7 | 16.6 |
| 9/8/95 | 16.8 | 0.99 | 18.4 | 15.1 |
| 9/9/95 | 16.8 | 0.70 | 17.7 | 15.6 |
| 9/10/95 | 16.9 | 0.75 | 17.9 | 15.6 |
| 9/11/95 | 16.9 | 0.82 | 18.0 | 15.6 |
| 9/12/95 | 17.2 | 2.37 | 23.1 | 14.4 |

Table 10. Daily temperature summaries for temperatures (°C) taken every 48 minutes in Buckeye Cove at Lower Salmon Falls Reservoir in 1995.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 5/31/95 | 19.2 | 3.22 | 26.0 | 16.3 |
| 6/1/95 | 17.4 | 1.03 | 20.0 | 16.3 |
| 6/2/95 | 17.1 | 0.43 | 17.9 | 16.6 |
| 6/3/95 | 18.2 | 0.63 | 19.3 | 17.4 |
| 6/4/95 | 20.2 | 0.89 | 21.6 | 19.1 |
| 6/5/95 | 19.3 | 0.86 | 21.3 | 18.0 |
| 6/6/95 | 18.9 | 0.73 | 20.1 | 17.2 |
| 6/7/95 | 15.4 | 0.59 | 16.9 | 14.5 |
| 6/8/95 | 14.5 | 0.41 | 15.0 | 13.9 |
| 6/9/95 | 14.6 | 0.15 | 14.8 | 14.4 |
| 6/10/95 | 14.7 | 0.63 | 15.8 | 14.1 |
| 6/11/95 | 15.6 | 0.88 | 17.0 | 14.5 |
| 6/12/95 | 17.0 | 0.64 | 18.4 | 16.3 |
| 6/13/95 | 17.9 | 0.86 | 19.5 | 16.7 |
| 6/14/95 | 18.8 | 0.44 | 20.0 | 17.9 |
| 6/15/95 | 18.9 | 0.80 | 20.0 | 17.5 |
| 6/16/95 | 19.4 | 0.86 | 20.6 | 18.4 |
| 6/17/95 | 19.2 | 0.54 | 20.1 | 18.4 |
| 6/18/95 | 19.0 | 0.85 | 20.3 | 17.9 |
| 6/19/95 | 19.1 | 0.48 | 20.0 | 18.0 |
| 6/20/95 | 18.9 | 0.67 | 20.0 | 18.0 |
| 6/21/95 | 18.6 | 0.65 | 19.5 | 17.5 |
| 6/22/95 | 16.9 | 0.63 | 18.4 | 16.1 |
| 6/23/95 | 17.0 | 1.44 | 19.1 | 15.6 |
| 6/24/95 | 18.5 | 0.85 | 19.8 | 17.4 |
| 6/25/95 | 19.4 | 0.59 | 20.3 | 18.5 |
| 6/26/95 | 20.0 | 0.65 | 21.1 | 19.1 |
| 6/27/95 | 20.6 | 0.69 | 21.8 | 19.5 |
| 6/28/95 | 21.7 | 0.99 | 23.1 | 20.3 |
| 6/29/95 | 20.9 | 0.86 | 22.3 | 19.6 |
| 6/30/95 | 19.9 | 0.57 | 20.6 | 18.7 |
| 7/1/95 | 19.5 | 0.65 | 20.3 | 18.0 |
| 7/2/95 | 20.5 | 0.80 | 21.9 | 19.6 |
| 7/3/95 | 20.5 | 0.77 | 21.6 | 19.5 |
| 7/4/95 | 20.7 | 0.38 | 21.4 | 20.1 |
| 7/5/95 | 19.8 | 0.91 | 21.1 | 18.5 |
| 7/6/95 | 19.7 | 0.51 | 20.3 | 18.8 |
| 7/7/95 | 20.0 | 0.53 | 20.8 | 18.7 |
| 7/8/95 | 20.6 | 0.35 | 21.4 | 20.0 |
| 7/9/95 | 21.0 | 0.60 | 22.4 | 20.1 |
| 7/10/95 | 20.8 | 0.97 | 22.6 | 19.1 |
| 7/11/95 | 20.9 | 0.78 | 22.4 | 19.8 |
| 7/12/95 | 21.0 | 0.78 | 22.9 | 20.1 |
| 7/13/95 | 21.6 | 1.05 | 22.9 | 20.3 |
| 7/14/95 | 21.5 | 1.36 | 26.2 | 19.8 |
| 7/15/95 | 21.4 | 0.85 | 22.8 | 20.1 |
| \ | NO DATA | | | |
| 7/22/95 | 21.5 | 0.98 | 22.9 | 20.0 |

Table 10. Continued.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 7/23/95 | 21.5 | 1.24 | 23.3 | 19.5 |
| 7/24/95 | 21.7 | 1.07 | 23.3 | 20.1 |
| 7/25/95 | 21.6 | 1.20 | 23.6 | 20.1 |
| 7/26/95 | 20.8 | 0.43 | 21.6 | 20.0 |
| 7/27/95 | 21.8 | 1.15 | 23.6 | 20.6 |
| 7/28/95 | 21.0 | 0.64 | 22.4 | 20.0 |
| 7/29/95 | 21.2 | 0.42 | 21.8 | 20.6 |
| 7/30/95 | 21.3 | 0.45 | 22.1 | 20.1 |
| 7/31/95 | 20.0 | 0.84 | 21.6 | 18.7 |
| 8/1/95 | 19.1 | 0.48 | 20.0 | 18.4 |
| 8/2/95 | 19.3 | 0.49 | 20.5 | 18.7 |
| 8/3/95 | 20.8 | 1.32 | 22.8 | 19.3 |
| 8/4/95 | 20.3 | 0.68 | 21.4 | 19.1 |
| 8/5/95 | 20.9 | 0.45 | 21.6 | 20.3 |
| 8/6/95 | 20.5 | 0.44 | 21.4 | 19.8 |
| 8/7/95 | 20.7 | 0.46 | 22.3 | 20.1 |
| 8/8/95 | 21.7 | 1.30 | 23.3 | 19.8 |
| 8/9/95 | 20.8 | 0.72 | 22.4 | 19.6 |
| 8/10/95 | 19.3 | 0.64 | 20.1 | 18.0 |
| 8/11/95 | 19.6 | 0.46 | 20.5 | 19.1 |
| 8/12/95 | 19.6 | 0.78 | 20.8 | 18.4 |
| 8/13/95 | 19.5 | 0.70 | 20.8 | 18.5 |
| 8/14/95 | 19.0 | 0.66 | 20.3 | 18.0 |
| 8/15/95 | 18.5 | 0.41 | 19.1 | 17.9 |
| 8/16/95 | 19.3 | 0.84 | 21.0 | 18.5 |
| 8/17/95 | 19.7 | 0.47 | 20.5 | 19.0 |
| 8/18/95 | 20.0 | 0.59 | 21.0 | 19.0 |
| 8/19/95 | 18.8 | 0.66 | 19.6 | 17.9 |
| 8/20/95 | 18.7 | 0.55 | 19.6 | 17.7 |
| 8/21/95 | 18.6 | 0.39 | 19.6 | 18.2 |
| 8/22/95 | 19.6 | 0.64 | 20.6 | 18.8 |
| 8/23/95 | 20.0 | 0.55 | 20.6 | 18.7 |
| 8/24/95 | 20.0 | 0.60 | 20.8 | 18.7 |
| 8/25/95 | 20.3 | 0.60 | 21.4 | 19.1 |
| 8/26/95 | 20.3 | 0.42 | 21.3 | 19.6 |
| 8/27/95 | 20.6 | 0.95 | 22.4 | 19.6 |
| 8/28/95 | 20.0 | 0.58 | 21.3 | 19.1 |
| 8/29/95 | 19.8 | 0.53 | 21.0 | 19.0 |
| 8/30/95 | 20.4 | 0.75 | 21.6 | 19.3 |
| 8/31/95 | 19.4 | 0.62 | 20.6 | 18.5 |
| 9/1/95 | 19.3 | 0.39 | 20.0 | 18.7 |
| 9/2/95 | 19.8 | 1.01 | 21.6 | 18.7 |
| 9/3/95 | 19.8 | 0.50 | 20.8 | 19.1 |
| 9/4/95 | 19.7 | 0.50 | 20.6 | 19.0 |
| 9/5/95 | 19.6 | 0.64 | 20.6 | 18.7 |
| 9/6/95 | 20.4 | 0.82 | 21.8 | 19.3 |
| 9/7/95 | 19.4 | 0.74 | 21.0 | 18.4 |
| 9/8/95 | 19.5 | 0.72 | 20.6 | 18.4 |
| 9/9/95 | 18.5 | 0.68 | 19.6 | 17.4 |

Table 10. Continued.

| Date | Daily mean temperature | Standard deviation | Daily max. temperature | Daily min. temperature |
|---|---|---|---|---|
| 9/10/95 | 17.7 | 0.42 | 18.5 | 17.2 |
| 9/11/95 | 17.8 | 0.85 | 19.3 | 16.9 |
| 9/12/95 | 18.2 | 0.98 | 19.8 | 17.0 |
| 9/13/95 | 18.3 | 1.95 | 22.6 | 13.9 |

## Mormon Reservoir

One sinking and one floating gill net were set overnight on the afternoon of April 10, 1995. One female yellow perch 220 mm long and two male yellow perch each 120 mm long were the only fish caught. It is suspected that no trout survived the previous year's low water conditions.

## Oakley Reservoir

Forage fish presence and relative abundance were measured in Oakley Reservoir utilizing the 15.2 m long, 6.2 mm bar mesh beach seine at five sites along the west side of the reservoir on September 13, 1995. All fish sampled were identified and enumerated. A total of 113 spottail shiners *Notropis hudsonius* and five mottled sculpin *Cottus bairdi* were sampled (Table 11). Water temperature at time of seining was 17°C.

A bottom trawl was used to sample young-of-the-year (YOY) walleye *Stizostedion vitreum* from the southern third of the reservoir and the Trapper Creek arm on September 13, 1995. A total of five trawls were made which netted one walleye 225 mm long and 17 spottail shiners.

## Salmon Falls Creek Reservoir

Salmon Falls Creek Reservoir fish were sampled by nighttime midwater trawling, beach seining, and bottom trawling. Daytime temperature and dissolved oxygen profiles were measured at four sites in 1995.

Kokanee were sampled using the midwater trawl on the night of June 28, 1995 north of Grey's Landing. A total of five transects were trawled with three to five steps trawled per transect for five minutes per step. Depths trawled ranged from 3.7 to 22.0 m. Trawling efforts resulted in sampling only three kokanee, two at 80 mm in length and one at 260 mm. No density or population estimates were possible with such low numbers of fish in the sample. Other species sampled in the trawl include two hatchery rainbow trout and approximately 450 age 0+ yellow perch. Results of the daytime temperature/dissolved oxygen profiles are given in Figure 6. Results indicated dissolved oxygen levels at 8 mg/l or greater from the surface to at least 15 m and temperatures 15°C or lower below 4 m deep. These conditions throughout most

of the water column may have contributed to the poor sampling with the midwater trawl if the fish were widely scattered.

Five sites were sampled with the 15.2 m long, 6.2 mm bar mesh beach seine on September 14, 1995 to monitor the presence of spottail shiner and other forage fish species. Approximately 10,900 YOY yellow perch (<70 mm total length), 26 spottail shiners, 157 YOY black crappie, and 7 YOY largescale suckers *Catostomus macrocheilus* were sampled (Table 12).

Table 11. Total length frequency and total numbers of fish sampled by beach seining at Oakley Reservoir on September 13, 1995.

| Length range (mm) | Spottail shiner Length | | Mottled sculpin Length | |
|---|---|---|---|---|
| | no. | % | no. | % |
| 0-9 | | | | |
| 10-19 | | | | |
| 20-29 | | | | |
| 30-39 | | | | |
| 40-49 | 7 | 23.3 | 1 | 20.0 |
| 50-59 | 20 | 66.7 | 3 | 60.0 |
| 60-69 | 3 | 10.0 | 1 | 20.0 |
| 70-79 | | | | |
| 80-89 | | | | |
| 90-99 | | | | |
| Number: | 30 | | 5 | |
| Avg length: | 52 | | 54 | |
| Total sampled: | 213 | | 5 | |

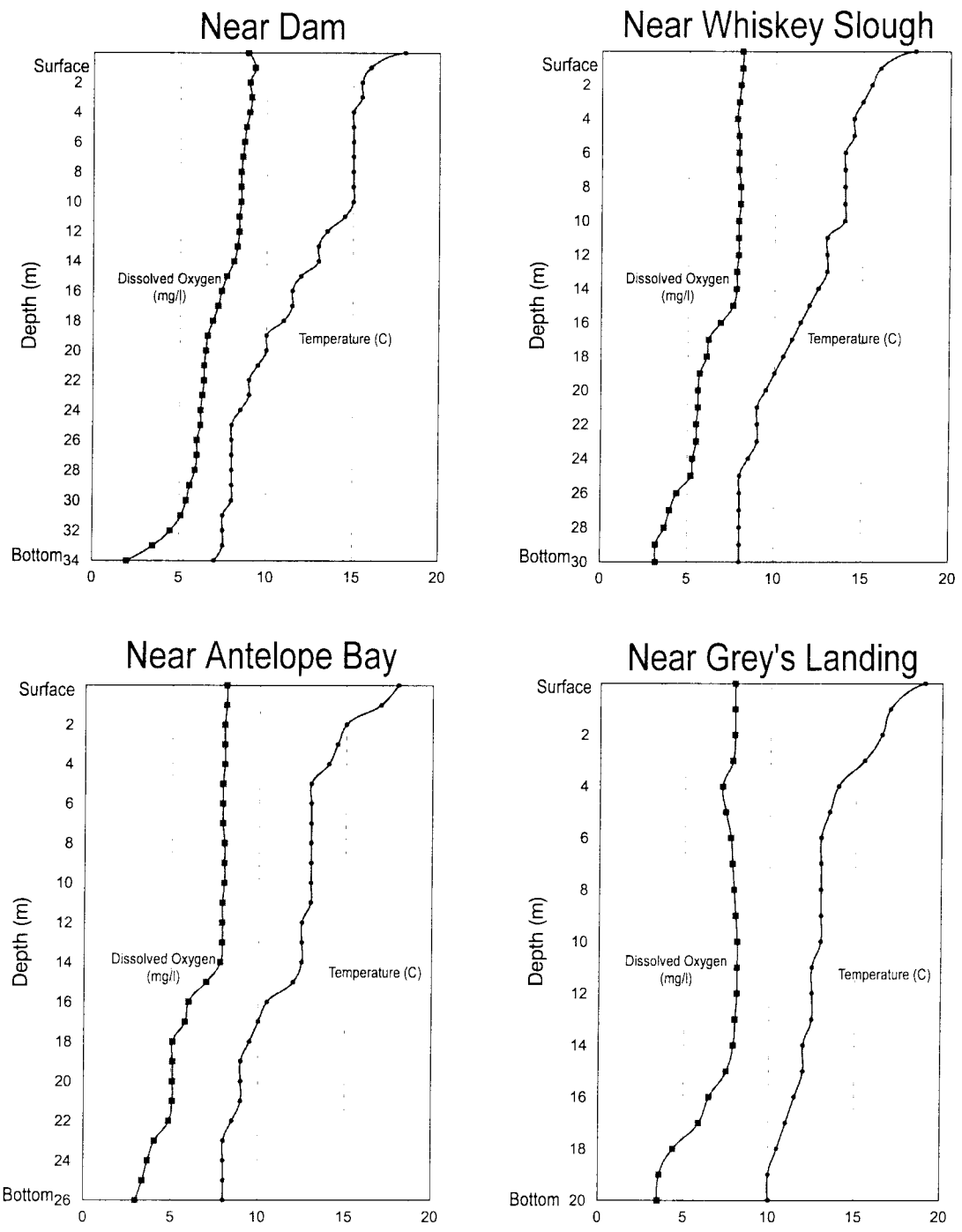


Figure 6. Daytime temperature and dissolved oxygen profiles for Salmon Falls Creek Reservoir, June 26, 1995.

Table 12. Total length frequency (mm) and numbers of fish sampled by beach seining four sites at Salmon Falls Creek Reservoir, September 1995.

| Length range | Yellow perch | | Black crappie | | Spottail shiner | | Largescale sucker | |
|---|---|---|---|---|---|---|---|---|
| (mm) | no. | % | no. | % | no. | % | no. | % |
| 0-9 | | | | | | | | |
| 10-19 | | | | | | | | |
| 20-29 | | | | | | | | |
| 30-39 | 2 | 4.5 | 9 | 25.0 | | | | |
| 40-49 | 24 | 54.5 | 27 | 75.0 | | | | |
| 50-59 | 9 | 20.5 | | | 3 | 11.5 | | |
| 60-69 | 2 | 4.5 | | | | | 3 | 42.9 |
| 70-79 | 1 | 2.3 | | | 1 | 3.8 | 4 | 57.1 |
| 80-89 | 3 | 6.8 | | | 8 | 30.8 | | |
| 90-99 | 2 | 4.5 | | | 14 | 53.8 | | |
| 100-109 | | | | | | | | |
| 110-119 | 1 | 2.3 | | | | | | |
| 120-129 | | | | | | | | |
| 130-139 | | | | | | | | |
| 140-149 | | | | | | | | |
| Number: | 44 | | 36 | | 26 | | 7 | |
| Avg length: | 53 | | 40 | | 84 | | 67 | |
| Total sampled: | 10,944 | | 157 | | 26 | | 7 | |

A bottom trawl was used on two separate days in September and October 1995 to determine the presence of YOY walleye. All trawling was done within the upper end of the reservoir between Grey's Landing Bay and the bay south of Goose Island. Three transects were trawled ranging from four to seven minutes on September 14, 1995, and five transects were trawled ranging from 4.5 to 10 minutes on October 24, 1995. Depths trawled ranged from 2.5 to 13 m. Approximately 2,050 fish were sampled in the trawl, which included only one 170 mm walleye. Other species sampled included approximately 1,700 YOY yellow perch, 48 age 1+ or older yellow perch averaging 197 mm long, 219 YOY black crappie, 55 spottail shiner averaging 90 mm long, and 1 largescale sucker 150 mm long (Table 13).

**Angler Survey**

An intensive creel survey was conducted on Salmon Falls Creek Reservoir May 27 through November 10, 1995. The Creel Census System (McArthur 1993) was used to select angler count times and data analysis. The entire period was split up into six 28-day intervals with times from two weekday days and two weekend days randomly selected for daytime counts within each interval. One weekday night and one weekend night were also randomly selected for each interval to get an estimate of nighttime fishing effort and success rates. One to three

Table 13. Total length frequency (mm) and numbers of fish[a] sampled by bottom trawling eight sites at Salmon Falls Creek Reservoir, September 1995.

| Length range (mm) | Walleye | | Yellow perch | | Spottail shiner | | Largescale sucker | |
|---|---|---|---|---|---|---|---|---|
| | no. | % | no. | % | no. | % | no. | % |
| 0-9 | | | | | | | | |
| 10-19 | | | | | | | | |
| 20-29 | | | | | | | | |
| 30-39 | | | | | | | | |
| 40-49 | | | | | | | | |
| 50-59 | | | | | 1 | 12.5 | | |
| 60-69 | | | | | | | | |
| 70-79 | | | | | | | | |
| 80-89 | | | | | | | | |
| 90-99 | | | | | 7 | 87.5 | | |
| 100-109 | | | | | | | | |
| 110-119 | | | | | | | | |
| 120-129 | | | 1 | 2.1 | | | | |
| 130-139 | | | 3 | 6.3 | | | | |
| 140-149 | | | 2 | 4.2 | | | | |
| 150-159 | | | 2 | 4.2 | | | 1 | 100.0 |
| 160-169 | | | 1 | 2.1 | | | | |
| 170-179 | 1 | 100.0 | 4 | 8.3 | | | | |
| 180-189 | | | 3 | 6.3 | | | | |
| 190-199 | | | 2 | 4.2 | | | | |
| 200-209 | | | 5 | 10.4 | | | | |
| 210-219 | | | 9 | 18.8 | | | | |
| 220-229 | | | 8 | 16.7 | | | | |
| 230-239 | | | 5 | 10.4 | | | | |
| 240-249 | | | 1 | 2.1 | | | | |
| 250-259 | | | 2 | 4.2 | | | | |
| 260-269 | | | | | | | | |
| 270-279 | | | | | | | | |
| 280-289 | | | | | | | | |
| 290-299 | | | | | | | | |
| Number: | 1 | | 48 | | 8 | | 1 | |
| Avg length: | 170 | | 197 | | 85 | | 150 | |
| Total sampled: | 1 | | 1,777 | | 56 | | 1 | |

[a] An additional 226 YOY black crappie were sampled with the bottom trawl but not measured.

counts were made at least two hours apart on each census day. The reservoir was split into three strata as indicated in Figure 7. Information gathered from each angler included hours fished, method and gear type used, and numbers of fish caught, kept, and released. All walleye and a subsample of other species retained in the creel were weighed and measured.

From May 27 through November 10, 1995 anglers fished an estimated 72,700 hours on Salmon Falls Creek Reservoir (Table 14). During the period June 24 through October 13, 1995 an estimated 57,100 hours of angler effort was expended, up 145% from a similar period in 1983 (Bell and Stevens 1984). Figure 8 shows the catch composition by age and length class of 103 walleye measured in the creel. Length-at-age estimates were based on scale analysis data from Partridge and Corsi (1993) and Warren and Partridge (1995). We made the assumption that the length frequency of fish sampled from the creel represented the length frequency of harvest for the entire 1996 fishing season. With that assumption we estimated that 15% of the walleye harvested were immature fish two years old and approximately 40% of the harvested walleye were >400 mm long. Estimated numbers of fish caught for each strata and time period are given in Table 15. Estimated catch rates were derived from the computer program for the daytime creel survey and derived by simple calculation from angler effort and catch for the nighttime creel survey due to the small sample size (Table 16).

There appears to be an insignificant amount of fishing effort and harvest during the nighttime hours on the reservoir despite the common notion by many fishermen that walleye fishing is more successful at night. A total of 21 nighttime counts were made throughout the entire survey period with 28 angler contacts made on 10 nights of surveys. An average of 1.8 anglers were counted per survey night with a maximum of nine anglers counted on July 13 and zero anglers counted 11 times. Seven walleye were counted as harvested and three were counted as caught and released from those 28 contacts, which accounted for 61 hours of fishing effort for a catch rate of 0.16 walleye/hour (Table 16).

## Thorn Creek Reservoir

Fish at Thorn Creek Reservoir were sampled by nighttime electrofishing on the evening of October 19, 1995. A total of 84 hatchery rainbow trout averaging 243 mm total length were sampled after approximately two hours of electrofishing with power on and off (Table 17). A histogram of the length frequency distribution indicates three length groups sampled from the population (Figure 9). The group of fish ranging from 100 to 179 mm in total length was probably from the 32,500 steelhead *Oncorhynchus mykiss* stocked as 36 mm fry on July 6, 1995. Fish from 190 to 289 mm were probably stocked as 90 mm fingerlings on May 9, 1995, and fish greater than 290 mm were probably stocked as 230 mm catchables in late April and early May 1995.

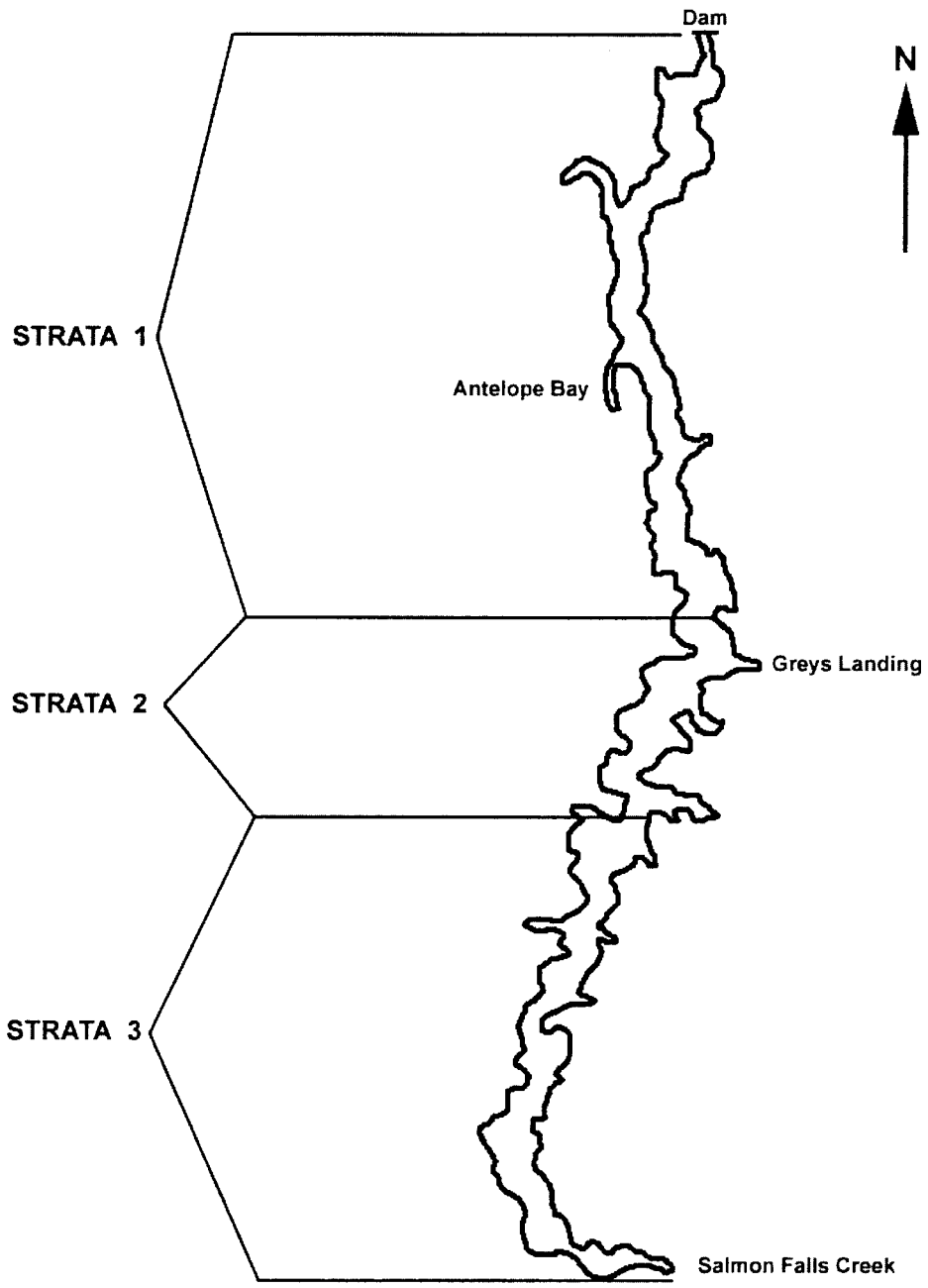


Figure 7. Map of Salmon Falls Creek Reservoir depicting strata boundaries for the 1995 intensive creel survey.

Table 14. Estimated total angler effort on Salmon Falls Creek Reservoir for May 27 through November 10, 1995. Confidence intervals are 95%.

| Interval | Strata | Angler hours | | | |
|---|---|---|---|---|---|
| | | Boat | Bank | Float tube | Total |
| May 27-June 23 | 1 | 2,458 ± 1,527 | 1,301 ± 1,052 | 0 | 3,760 ± 1,855 |
| | 2 | 2,115 ± 999 | 2,212 ± 1,524 | 0 | 4,326 ± 1,822 |
| | 3 | 2,932 ± 1,958 | 0 | 46 ± 91 | 2,978 ± 1,960 |
| June 24-July 21 | 1 | 2,996 ± 1,598 | 1,836 ± 877 | 0 | 4,831 ± 1,823 |
| | 2 | 2,902 ± 1,676 | 2,370 ± 1,025 | 127 ± 149 | 5,399 ± 1,971 |
| | 3 | 4,048 ± 1,702 | 795 ± 745 | 0 | 4,842 ± 1,858 |
| July 22-Aug 18 | 1 | 3,202 ± 1,608 | 3,145 ± 1,492 | 143 ± 177 | 6,489 ± 2,201 |
| | 2 | 1,425 ± 779 | 2,138 ± 500 | 19 ± 38 | 3,582 ± 926 |
| | 3 | 1,672 ± 1,130 | 76 ± 152 | 0 | 1,748 ± 1,140 |
| Aug 19-Sept 15 | 1 | 5,717 ± 1,434 | 4,722 ± 1,882 | 20 ± 39 | 10,457 ± 2,366 |
| | 2 | 2,614 ± 1,024 | 5,332 ± 1,292 | 0 | 7,946 ± 1,649 |
| | 3 | 713 ± 674 | 768 ± 1,200 | 0 | 1,480 ± 1,377 |
| Sept 16-Oct 13 | 1 | 1,555 ± 587 | 2,520 ± 1,021 | 55 ± 71 | 4,130 ± 1,180 |
| | 2 | 1,361 ± 637 | 4,188 ± 1,339 | 55 ± 71 | 5,604 ± 1,485 |
| | 3 | 375 ± 296 | 192 ± 278 | 0 | 567 ± 406 |
| Oct 14-Nov 10 | 1 | 500 ± 381 | 1,111 ± 704 | 0 | 1,611 ± 801 |
| | 2 | 322 ± 253 | 2,387 ± 2,019 | 0 | 2,709 ± 2,035 |
| | 3 | 250 ± 300 | 12 ± 24 | 0 | 262 ± 301 |
| Season totals by strata | 1 | 16,428 ± 3,165 | 14,635 ±3,030 | 218 ± 194 | 31,278 ± 4,386 |
| | 2 | 10,739 ± 2,436 | 18,627 ±3,341 | 201 ± 169 | 29,566 ± 4,138 |
| | 3 | 9,990 ± 2,939 | 1,843 ± 1,448 | 46 ± 91 | 11,877 ± 3,278 |
| Season totals | | 37,157 ± 4,959 | 35,105 ± 4,737 | 465 ± 274 | 72,721 ±6,864 |

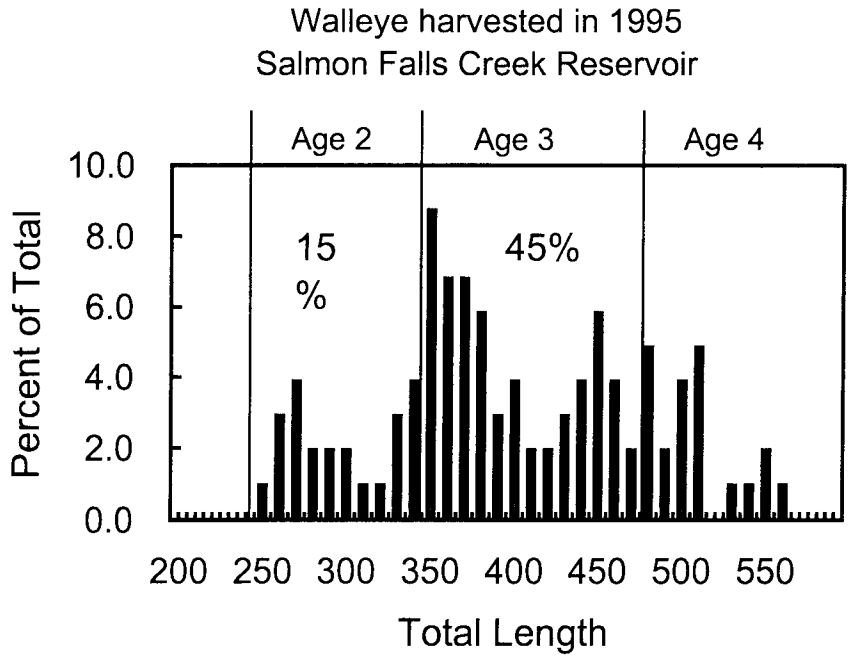


Figure 8. Catch composition by age and length class of 103 walleye in the angler creel at Salmon Falls Creek Reservoir in 1995.

Table 15. Estimated number of fish caught by anglers at Salmon Falls Creek Reservoir from May 27 through November 10, 1995. Confidence intervals are 95%.

| Interval | Strata | Total no. fish caught | Total no. fish kept | Hatchery rainbow trout | Wild rainbow trout | Kokanee | Walleye | Yellow perch | Smallmouth bass | Crappie |
|---|---|---|---|---|---|---|---|---|---|---|
| May 27-June 23 | 1 | 1,439 ± 1,587 | 1,340 ± 1,567 | 112 ± 166 | 0 | 0 | 19 ± 47 | 1,209 ± 1,532 | 0 | 0 |
| | 2 | 1,677 ± 1,019 | 1,550 ± 996 | 354 ± 556 | 0 | 193 ± 371 | 323 ± 358 | 615 ±582 | 65 ± 82 | 0 |
| | 3 | 612 ± 453 | 573 ± 428 | 77 ± 92 | 0 | 0 | 243 ± 251 | 236 ± 228 | 20 ± 15 | 0 |
| June 24-July 21 | 1 | 2,997 ± 2,101 | 1,995 ± 2,060 | 717 ± 814 | 0 | 53 ± 120 | 0 | 1,166 ± 1,335 | 53 ± 105 | 0 |
| | 2 | 6,186 ± 4,577 | 5,250 ± 4,107 | 50 ± 86 | 0 | 0 | 755 ± 1,144 | 4,382 ± 4,277 | 66 ± 141 | 0 |
| | 3 | 3,409 ± 2,345 | 3,122 ± 2,325 | 32 ± 43 | 0 | 0 | 479 ± 549 | 2,609 ± 2,375 | 0 | 0 |
| July 22-Aug 18 | 1 | 6,251 ± 4,021 | 5,821 ± 3,983 | 742 ± 815 | 0 | 42 ± 96 | 0 | 4,941 ± 4,259 | 89 ± 192 | 0 |
| | 2 | 1,709 ± 1,143 | 1,659 ± 1,128 | 402 ± 267 | 0 | 0 | 146 ± 161 | 1,112 ± 1,074 | 0 | 0 |
| | 3 | 224 ± 263 | 224 ± 263 | 52 ± 100 | 0 | 0 | 52 ± 112 | 119 ± 228 | 0 | 0 |
| Aug 19-Sept 15 | 1 | 7,814 ± 4,447 | 7,580 ± 4,180 | 4,358 ± 2,742 | 0 | 190 ± 437 | 117 ± 143 | 2666 ± 3,165 | 249 ± 485 | 0 |
| | 2 | 4,963 ± 3,086 | 4,963 ± 3,086 | 377 ± 329 | 0 | 0 | 94 ± 142 | 4,170 ± 2,874 | 0 | 322 ±650 |
| | 3 | 393 ± 338 | 267 ± 343 | 21 ± 34 | 0 | 0 | 0 | 246 ± 339 | 0 | 0 |
| Sept 16-Oct 13 | 1 | 2,447 ± 1,446 | 1,419 ± 1,268 | 872 ± 1,028 | 0 | 0 | 78 ± 102 | 432 ± 754 | 40 ± 87 | 0 |
| | 2 | 5,153 ± 2,876 | 4,985 ± 2,856 | 1,495 ±1,774 | 0 | 0 | 230 ± 211 | 3,259 ± 3,050 | 0 | 0 |
| | 3 | 289 ± 410 | 289 ± 410 | 121 ± 101 | 0 | 0 | 145 ± 428 | 24 ± 33 | 0 | 0 |
| Oct 14-Nov 10 | 1 | 412 ± 326 | 356 ± 325 | 356 ± 325 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 2,111 ± 1,622 | 1,860 ± 1,558 | 1,119 ±1,074 | 29 ± 69 | 0 | 185 ± 247 | 575 ± 658 | 11 ± 20 | 0 |
| | 3 | 144 ± 296 | 128 ± 285 | 11 ± 25 | 0 | 0 | 0 | 117 ± 259 | 0 | 0 |
| Season Total | | 48,230 ± 9,744 | 43,381 ± 9,328 | 11,268 ± 3,856 | 29 ± 69 | 478 ± 593 | 2,866 ± 1,477 | 27,818 ± 8,750 | 593 ± 564 | 322 ± 650 |

Table 16. Estimated daytime and nighttime catch rates at Salmon Falls Creek Reservoir from May 27 through November 10, 1995.

| | Catch rates (fish/hour) for fish kept and released | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Daytime[a] | | | | | | | | Nighttime[b] | |
| | Strata 1 | | Strata 2 | | Strata 3 | | Season average | | Season average | |
| Species | kept | rel. | kept | rel. | kept | rel. | kept | rel. | kept | rel. |
| Hatchery rainbow trout | 0.20 | 0.05 | 0.19 | 0.00 | 0.03 | 0.00 | 0.14 | 0.02 | 0.03 | 0.00 |
| Wild rainbow trout | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Kokanee | 0.01 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 |
| Walleye | 0.01 | 0.00 | 0.05 | 0.01 | 0.05 | 0.00 | 0.04 | 0.01 | 0.11 | 0.05 |
| Yellow perch | 0.24 | 0.02 | 0.40 | 0.01 | 0.18 | 0.03 | 0.27 | 0.02 | 0.02 | 0.00 |
| Smallmouth bass | 0.01 | 0.03 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| Crappie | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

[a] Daytime creel survey catch rate estimates were derived from the Creel Census System computer program (McArthur 1993).

[b] Nighttime creel survey catch rate estimates were derived by direct calculations from angler effort and number of fish caught without stratification due to the small sample size. Nighttime anglers were specifically targeting walleye while daytime averages include anglers fishing for all species.

Table 17. Total length frequency (mm) and average weights (g) of hatchery rainbow trout sampled by nighttime electrofishing at Thorn Creek Reservoir in October 1995.

| Length range | Length | | Weight | |
|---|---|---|---|---|
| (mm) | no. | % | no. | avg. |
| 0-9 | | | | |
| / | | | | |
| 100-109 | 1 | 1.2 | 1 | 12 |
| 110-119 | 1 | 1.2 | 1 | 16 |
| 120-129 | 4 | 4.8 | 4 | 22 |
| 130-139 | 6 | 7.1 | 6 | 27 |
| 140-149 | 6 | 7.1 | 6 | 32 |
| 150-159 | 3 | 3.6 | 3 | 39 |
| 160-169 | 2 | 2.4 | 2 | 56 |
| 170-179 | 1 | 1.2 | 1 | 64 |
| 180-189 | | | | |
| 190-199 | 1 | 1.2 | 1 | 84 |
| 200-209 | 3 | 3.6 | 3 | 115 |
| 210-219 | 1 | 1.2 | 1 | 140 |
| 220-229 | 3 | 3.6 | 3 | 147 |
| 230-239 | 2 | 2.4 | 2 | 165 |
| 240-249 | 6 | 7.1 | 6 | 198 |
| 250-259 | 4 | 4.8 | 4 | 220 |
| 260-269 | 5 | 6.0 | 5 | 248 |
| 270-279 | 2 | 2.4 | 2 | 270 |
| 280-289 | 2 | 2.4 | 2 | 283 |
| 290-299 | 1 | 1.2 | 1 | 280 |
| 300-309 | 4 | 4.8 | 4 | 294 |
| 310-319 | 6 | 7.1 | 6 | 328 |
| 320-329 | 6 | 7.1 | 6 | 372 |
| 330-339 | 8 | 9.5 | 8 | 386 |
| 340-349 | 3 | 3.6 | 3 | 450 |
| 350-359 | 2 | 2.4 | 2 | 380 |
| 360-369 | 1 | 1.2 | 1 | 620 |
| 370-379 | | | | |
| 380-389 | | | | |
| 390-399 | | | | |

| | |
|---|---|
| Number: | 84 |
| Avg length: | 243 |
| Total sampled: | 84 |

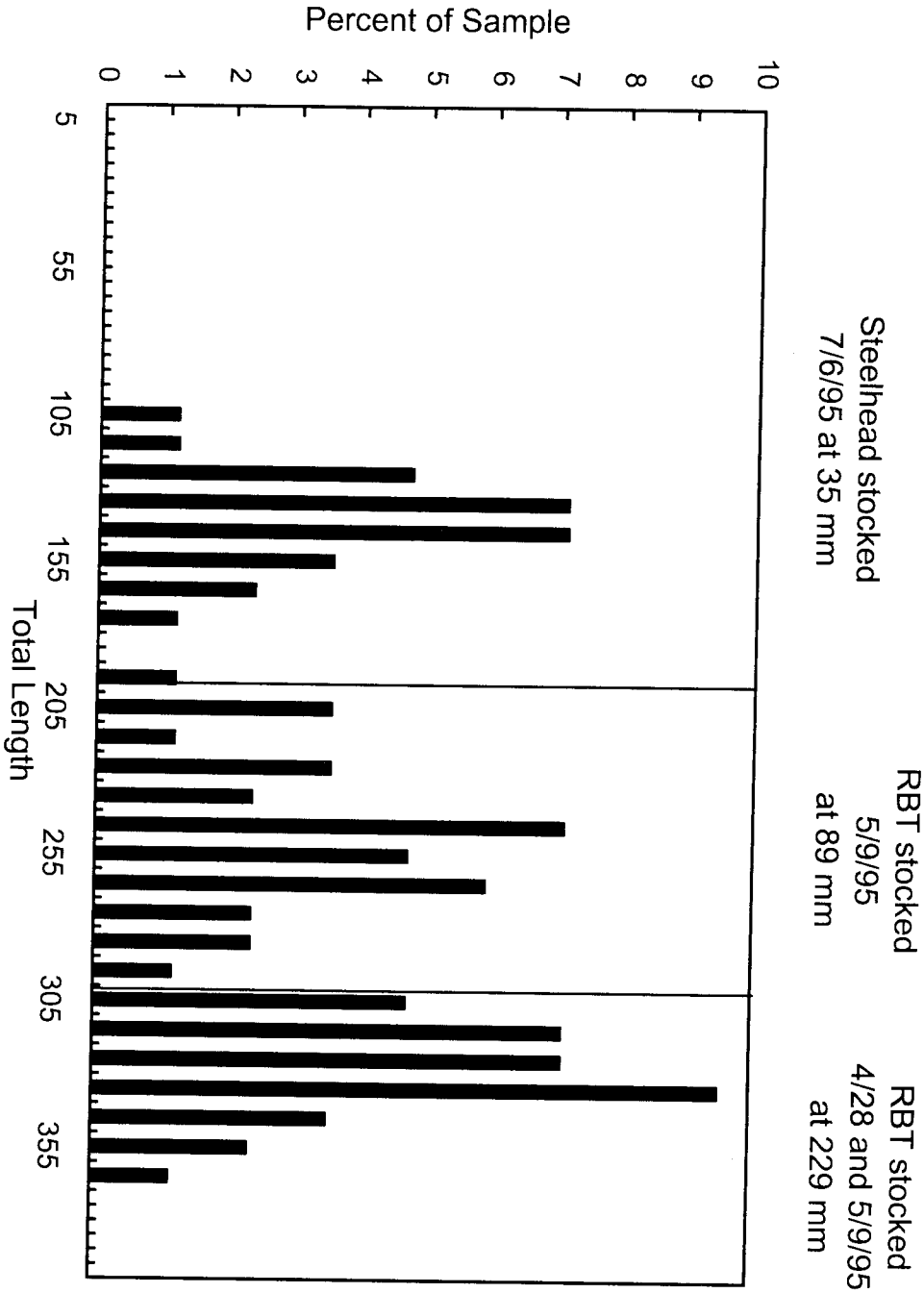


Figure 9. Total length frequency histogram of fish sampled by nighttime electrofishing at Thorn Creek Reservoir in October 1995.

## Miscellaneous Regional Creel Surveys

A region wide creel survey was made on Saturday, May 27 (Memorial Day weekend) by conservation officers and other Magic Valley Region personnel (Table 18). This survey included streams open during the general fishing season as well as waters already open to fishing. There were 25 waters surveyed; a total of 851 anglers were interviewed with 2,323 hours of effort for an overall catch rate of 0.5 fish per hour. Spot creel checks were performed mostly by conservation officers and regional fishery personnel on days other than on Memorial Day weekend (Table 19). Totals of 3,012 anglers with 8,037 hours of effort and an overall catch rate of 0.38 fish per hour were reported on 32 waters throughout the region.

Table 18. Results of spot creel checks performed on Magic Valley Region waters on opening weekend (May 27 and 28) of the general fishing season, 1995.

| Lake, river, stream | Anglers | Hours fished | Species[a] | Kept | Released | Catch |
|---|---|---|---|---|---|---|
| Billingsley Creek | 10 | 14 | ALL | 8 | | 8 |
| | | | HRB | 7 | | 7 |
| | | | BRN | 1 | | 1 |
| Bruneau Sand Dunes Ponds | 23 | 41 | ALL | 47 | 10 | 57 |
| | | | BG | 7 | | 7 |
| | | | LMB | 40 | 10 | 50 |
| Cassia Creek | 10 | 10 | ALL | 13 | | 13 |
| | | | HRB | 13 | | 13 |
| Crystal Springs | 10 | 17 | ALL | 7 | | 7 |
| | | | HRB | 7 | | 7 |
| Clyde Creek | 9 | 10 | ALL | 3 | 2 | 5 |
| | | | HRB | 2 | 2 | 4 |
| | | | EB | 1 | | 1 |
| Dog Creek Reservoir | 5 | 5 | ALL | | 1 | 1 |
| | | | HRB | | 1 | 1 |
| Fish Creek Reservoir | 9 | 15 | ALL | 3 | 1 | 4 |
| | | | HRB | 3 | 1 | 4 |
| Hagerman WMA ( March 1) | 144 | 320 | ALL | 111 | 131 | 242 |
| | | | HRB | 111 | 131 | 242 |
| Hagerman WMA (July 1) | 32 | 114 | ALL | 100 | 50 | 150 |
| | | | HRB | 24 | | 24 |
| | | | BG | 71 | 11 | 82 |
| | | | LMB | 1 | 37 | 38 |
| | | | YP | 4 | 2 | 6 |
| Little Camas Reservoir | 59 | 210 | ALL | 39 | | 39 |
| | | | HRB | 39 | | 39 |
| Little Wood Reservoir | 29 | 46 | ALL | 17 | | 17 |
| | | | HRB | 17 | | 17 |
| Magic Reservoir | 14 | 14 | ALL | 4 | | 4 |
| | | | HRB | 4 | | 4 |
| Malad River | 13 | 39 | ALL | | 12 | 12 |
| | | | WRB | | 12 | 12 |
| Milner Reservoir | 23 | 80 | ALL | 2 | | 2 |
| | | | CRP | 1 | | 1 |
| | | | YP | 1 | | 1 |
| Mormon Reservoir | 47 | 97 | ALL | 5 | | 5 |
| | | | HRB | 5 | | 5 |

Table 18. Continued.

| Lake, river, stream | Anglers | Hours fished | Species[a] | Kept | Released | Catch |
|---|---|---|---|---|---|---|
| Niagara Springs | 2 | 2 | ALL | 2 | | 2 |
| | | | HRB | 2 | | 2 |
| Oakley Reservoir | 5 | 14 | NO FISH | | | |
| Rock Creek | 33 | 81 | ALL | 55 | | 55 |
| | | | HRB | 7 | | 7 |
| | | | WRB | 31 | | 31 |
| | | | BRN | 17 | | 17 |
| Roseworth Reservoir | 90 | 298 | ALL | 77 | | 77 |
| | | | HRB | 77 | | 77 |
| Salmon Falls Creek Reservoir | 111 | 337 | ALL | 55 | 7 | 62 |
| | | | HRB | 14 | | 14 |
| | | | WE | 9 | 3 | 12 |
| | | | KOK | 6 | 1 | 7 |
| | | | YP | 26 | 2 | 28 |
| | | | SMB | | 1 | 1 |
| Silver Creek | 102 | 336 | ALL | 68 | 214 | 282 |
| | | | HRB | 4 | | 4 |
| | | | WRB | 32 | 206 | 238 |
| | | | BRN | 30 | 7 | 37 |
| | | | EB | 2 | 1 | 3 |
| Snake River | 2 | 1 | NO FISH | | | |
| South Fork Boise River | 14 | 24 | ALL | | 4 | 4 |
| | | | WRB | | 4 | 4 |
| Sublett Creek | 6 | 10 | ALL | 3 | 7 | 10 |
| | | | HRB | 2 | 2 | 4 |
| | | | CT | 1 | 5 | 6 |
| Sublett Reservoir | 43 | 180 | ALL | 24 | | 24 |
| | | | HRB | 4 | | 4 |
| | | | BRN | 1 | | 1 |
| | | | KOK | 12 | | 12 |
| | | | C/RB | 4 | | 4 |
| | | | CT | 3 | | 3 |
| Trapper Creek | 6 | 8 | ALL | 4 | | 4 |
| | | | HRB | 1 | | 1 |
| | | | WRB | 3 | | 3 |

[a] HRB - hatchery rainbow trout, WRB - wild rainbow trout, BRN - brown trout, WE - walleye, KOK - kokanee, BG - bluegill, LMB - largemouth bass, C/RB - cutthroat-rainbow trout hybrid, SMB - smallmouth bass, CRP -carp, CT - cutthroat trout, EB- brook trout, YP - yellow perch.

Table 19. Results of spot creel checks performed on Magic Valley Region waters in 1995.

| Lake, river, stream | Anglers | Hours fished | Species[a] | Kept | Released | Catch |
|---|---|---|---|---|---|---|
| Anderson Ranch Reservoir | 32 | 69 | ALL | 69 | 4 | 73 |
| | | | HRB | 3 | | 3 |
| | | | KOK | 63 | | 63 |
| | | | MWF | | 1 | 1 |
| | | | YP | 1 | 2 | 3 |
| | | | SQF | 2 | | 2 |
| | | | SMB | | 1 | 1 |
| Big Smoky Creek | 10 | 33 | ALL | 23 | | 23 |
| | | | HRB | 20 | | 20 |
| | | | WRB | 1 | | 1 |
| | | | KOK | 2 | | 2 |
| Big Wood River | 93 | 170 | ALL | 15 | 114 | 129 |
| | | | MWF | 15 | | 15 |
| | | | WRB | | 114 | 114 |
| Burley Gravel Pond | 5 | 4 | ALL | 2 | | 2 |
| | | | CRP | 2 | | 2 |
| Cassia Creek | 2 | 6 | ALL | 2 | | 2 |
| | | | HRB | 1 | | 1 |
| | | | WRB | 1 | | 1 |
| Cedar Draw Creek | 5 | 11 | ALL | 3 | | 3 |
| | | | WRB | 3 | | 3 |
| Crystal Lake | 62 | 134 | ALL | 86 | | 86 |
| | | | HRB | 85 | | 85 |
| | | | WRB | 1 | | 1 |
| Deep Creek | 8 | 5 | ALL | 7 | | 7 |
| | | | HRB | 6 | | 6 |
| | | | WRB | 1 | | 1 |
| Dierkes Lake | 39 | 102 | ALL | 40 | 13 | 53 |
| | | | HRB | 40 | 10 | 50 |
| | | | LMB | | 3 | 3 |
| Dog Creek Reservoir | 24 | 40 | ALL | 55 | | 55 |
| | | | HRB | 19 | | 19 |
| | | | BG | 17 | | 17 |
| | | | YP | 16 | | 16 |
| | | | LMB | 2 | | 2 |
| | | | BBH | 1 | | 1 |
| Emerald Lake | 141 | 262 | ALL | 18 | | 18 |
| | | | HRB | 17 | | 17 |
| | | | YP | 1 | | 1 |
| Fish Creek Reservoir | 47 | 110 | ALL | 49 | | 49 |
| | | | HRB | 47 | | 47 |
| | | | EB | 2 | | 2 |

Table 19. Continued.

| Lake, river, stream | Anglers | Hours fished | Species[a] | Kept | Released | Catch |
|---|---|---|---|---|---|---|
| Gun Club Pond | 34 | 45 | ALL | 23 | | 23 |
| | | | HRB | 20 | | 20 |
| | | | BG | 2 | | 2 |
| | | | YP | 1 | | 1 |
| Hagerman WMA | 28 | 66 | ALL | 32 | | 32 |
| | | | HRB | 24 | | 24 |
| | | | BG | 5 | | 5 |
| | | | LMB | 3 | | 3 |
| Lake Cleveland | 53 | 94 | ALL | 37 | 2 | 39 |
| | | | HRB | 37 | 2 | 39 |
| Lake Walcott (near dam) | 266 | 271 | ALL | 78 | 1 | 79 |
| (Gifford Springs) | 16 | 40 | HRB | 78 | 1 | 79 |
| | | | ALL | 1 | 1 | 2 |
| (Smith Springs) | 11 | 25 | HRB | 1 | 1 | 2 |
| | | | ALL | 4 | | 4 |
| | | | HRB | 4 | | 4 |
| Little Camas Reservoir | 8 | 40 | ALL | 18 | | 18 |
| | | | HRB | 18 | | 18 |
| Little Smoky Creek | 49 | 122 | ALL | 70 | 1 | 71 |
| | | | HRB | 68 | | |
| | | | EB | 2 | | 2 |
| | | | BU | | 1 | 1 |
| Little Wood Reservoir | 3 | 21 | ALL | 15 | | 15 |
| | | | HRB | 15 | | 15 |
| Little Wood Reservoir (research data) | | 55,000 | ALL | 39,000 | 14,000[b] | 54,000 |
| | | | HRB | 26,000 | | |
| | | | RBT | 13,000 | | |
| Lower Salmon Falls Reservoir | 1 | 3 | ALL | | 1 | 1 |
| | | | CRP | | 1 | 1 |
| Magic Reservoir | 1 | 4 | ALL | 8 | | 8 |
| | | | WRP | 1 | | 1 |
| | | | YP | 7 | | 7 |
| Magic Reservoir (research data) | | 47,600 | ALL | 17,000 | 4,000[b] | 21,000 |
| | | | HRB | 10,000 | | |
| | | | RBT | 2,000 | | |
| | | | YP | 5,000 | | |
| | | | BRN | 103 | | |

Table 19. Continued.

| Lake, river, stream | Anglers | Hours fished | Species[a] | Kept | Released | Catch |
|---|---|---|---|---|---|---|
| Milner Reservoir | 172 | 353 | ALL | 169 | 16 | 185 |
| | | | HRB | 7 | | 7 |
| | | | WRB | 4 | | 4 |
| | | | CRP | 7 | | 7 |
| | | | SMB | 4 | 16 | 20 |
| | | | YP | 62 | | 62 |
| | | | SU | 1 | | 1 |
| | | | CHU | 1 | | 1 |
| | | | BBH | 83 | | 83 |
| Mormon Reservoir | 5 | 19 | ALL | 5 | | 5 |
| | | | HRB | 5 | | 5 |
| Murtaugh Lake | 30 | 47 | ALL | 3 | | 3 |
| | | | BBH | 2 | | 2 |
| | | | CRP | 1 | | 1 |
| Niagara Springs | 17 | 26 | ALL | 13 | | 13 |
| | | | HRB | 13 | | 13 |
| Oakley Reservoir | 121 | 460 | ALL | 145 | | 145 |
| | | | HRB | 72 | | 72 |
| | | | WE | 67 | | 67 |
| | | | YP | 4 | | 4 |
| | | | CT | 2 | | 2 |
| Rock Creek | 37 | 55 | ALL | 26 | | 26 |
| | | | HRB | 24 | | 24 |
| | | | WRB | 2 | | 2 |
| Rock Creek Park | 6 | 5 | ALL | 1 | 2 | 3 |
| | | | HRB | 1 | 2 | 3 |
| Roseworth Reservoir | 233 | 1,004 | ALL | 210 | 16 | 226 |
| | | | HRB | 210 | 16 | 226 |
| Salmon Falls Creek Reservoir (spot creel) | 339 | 1,240 | ALL | | | |
| | | | HRB | 160 | 5 | 165 |
| | | | WE | 23 | 16 | 39 |
| | | | YP | 312 | | 312 |
| | | | KOK | 10 | | 10 |
| | | | SMB | 16 | | 16 |
| Salmon Falls Creek Reservoir (extensive creel) | 632 | 1,975 | ALL | 1,094 | 155 | 1,249 |
| | | | HRB | 242 | 23 | 265 |
| | | | WRB | 1 | | 1 |
| | | | KOK | 4 | 1 | 5 |
| | | | WE | 101 | 24 | 125 |
| | | | YP | 728 | 79 | 807 |
| | | | SMB | 11 | 26 | 37 |
| | | | BC | 7 | 2 | 9 |

Table 19. Continued.

| Lake, river, stream | Anglers | Hours fished | Species[a] | Kept | Released | Catch |
|---|---|---|---|---|---|---|
| Silver Creek | 8 | 20 | ALL | 1 | 4 | 5 |
| | | | WRB | 1 | 4 | 5 |
| Snake River | 3 | 6 | ALL | 2 | | 2 |
| (Bell Rapids) | | | HRB | 2 | | 2 |
| (Below Minidoka) | 296 | 662 | ALL | 68 | | 68 |
| | | | HRB | 64 | | 64 |
| | | | SMB | 1 | | 1 |
| | | | CC | 1 | | 1 |
| | | | MWF | 2 | | 2 |
| (Centennial Park) | 14 | 26 | ALL | 5 | | 5 |
| | | | SU | 1 | | 1 |
| | | | CHU | 4 | | 4 |
| South Fork Boise River | 33 | 44 | ALL | 23 | | 23 |
| | | | HRB | 5 | | 5 |
| | | | WRB | 16 | | 16 |
| | | | KOK | 2 | | 2 |
| Stone Reservoir | 34 | 134 | ALL | 93 | 2 | 95 |
| | | | HRB | 60 | | 60 |
| | | | YP | 32 | | 32 |
| | | | BC | 1 | | 1 |
| | | | LMB | | 2 | 2 |
| Sublett Creek | 7 | 16 | ALL | 2 | 1 | 3 |
| | | | HRB | 2 | | 2 |
| | | | CT | | 1 | 1 |
| Sublett Reservoir | 75 | 218 | ALL | 56 | 5 | 61 |
| | | | HRB | 32 | 2 | 34 |
| | | | KOK | 8 | 2 | 10 |
| | | | CT | 12 | 1 | 13 |
| | | | BRN | 4 | | 4 |
| Trapper Creek | 12 | 50 | ALL | 18 | | 18 |
| | | | HRB | 14 | | 14 |
| | | | CT | 3 | | 3 |
| | | | EB | 1 | | 1 |

[a] RB - Hatchery rainbow trout, WRB - Wild rainbow trout, RBT - Rainbow trout of unknown origin, CT - Cutthroat, BRN - Brown trout, EB - Eastern brook trout, BT - Bull trout, KOK - Kokanee, MWF - Mountain whitefish, BG - Bluegill, LMB - Largemouth bass, SMB - Smallmouth bass, BC - Black crappie, WE - Walleye, YP - Yellow Perch, CC - Channel Catfish, BBH - Brown bullhead, SQF - Northern pikeminnow *Ptychocheilus oregonensis*, CHU - Chub, CRP - Carp, SU - Sucker.

[b] Fish not identified.

## LITERATURE CITED


Bell, R.J. and J. Stevens. 1984. Regional fisheries management investigations. Idaho Department of Fish and Game, 1983 Job Performance Report. Project F-71-R-18, Boise.

McArthur, T. 1993. Statewide Angler Opinion and Harvest Surveys. Creel Census System. Idaho Department of Fish and Game, Job Completion Report. Project F-71-R-14, Subproject 1, Study 1, Boise.

Partridge, F.E. and C.E. Corsi. 1993. Regional fisheries management investigations. Idaho Department of Fish and Game, 1990 Job Performance Report. Project F-71-R-15, Boise.

Rieman, B.E. 1992. Kokanee Salmon Population Dynamics - Kokanee Salmon Monitoring Guidelines, Status and Analysis of Salmonid Fisheries, Project F-73-R-14 Subproject II, Study II. Idaho Department of Fish and Game, Boise.

Warren, C.D. and F.E. Partridge. 1995. Regional fisheries management investigations. Idaho Department of Fish and Game, 1993 Job Performance Report. Project F-71-R-18, Boise.

Warren, C.D. and F.E. Partridge. 1996. Regional fisheries management investigations. Idaho Department of Fish and Game, 1994 Job Performance Report. Project F-71-R-19, Boise.

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-20

Project I: Surveys and Inventories

Subproject I-E: Magic Valley Region

Job: c

Title: Rivers and Streams Investigations

Contract Period: July 1, 1995 to June 30, 1996

## ABSTRACT

Whirling disease parasite *Myxosoma cerebralis* was confirmed to be present in late winter 1995 in samples of wild rainbow trout *Oncorhynchus mykiss* from Warm Springs Creek, a tributary to the Big Wood River and near Hailey. An early fall fish population assessment at sites studied in previous years indicates that several year classes of wild rainbow trout are present within all reaches studied. The presence of the whirling disease pathogen within the Big Wood River drainage has not appeared to impact the trout population at any site.

Billingsley Creek was electrofished on two days within the Billingsley Creek Wildlife Management Area. Fish sampled included good numbers of rainbow trout and brown trout *Salmo trutta*, numerous Utah chub *Gila atraria*, and a few redside shiner *Richardsonius balteatus.*

Thousand Springs Creek was electrofished to assess the fish population and to determine whether or not the trout were preying on native fish species including Shoshone sculpin *Cottus greenei.* Fish sampled included rainbow trout, mountain whitefish *Prosopium williamsoni* and seven nongame fish species that are not typically piscivorous. Sixteen of the larger trout were sacrificed for stomach analysis with results indicating that none had recently consumed a vertebrate prey item.

We assisted the Idaho Department of Environmental Quality with 22 stream surveys for its Beneficial Use Reconnaissance Project. Sampling included fishery surveys on streams throughout the region.

Author:

Charles D. Warren
Regional Fishery Biologist

## OBJECTIVES

To maintain information for fishery management activities and decisions for rivers and streams.

## METHODS

Stream habitat data were collected using ocular and measurement techniques described by Idaho Department of Fish and Game (IDFG; 1992). Fish sampling gear included a Smith-Root Model 15-A backpack shocker and a Coffelt Model VVP-15 shocker powered by a 5,000 watt generator mounted in an aluminum canoe or drift boat. Output with the Coffelt shocker was set to unpulsed direct current (DC). Crews using the Coffelt shocker in the canoe waded with two people each using one anode and three or four other crew members netting stunned fish. Crews using the Coffelt shocker in the drift boat netted fish from within the boat as another crew member rowed and operated the generator and shocker. The backpack shocker was used with one shocker operator and two or three netters. Population estimates were made using a two step depletion method (Seber and LeCren 1967) or an adjusted (Chapman) Peterson Mark-Recapture method (Ricker 1975). The Peterson Mark-Recapture method was done by fin clipping all salmonids at least one year old with a hole punch in the caudal fin prior to release back into the sample reach. Crews returned one week later to sample for the ratio estimate. Sampled fish were identified, total lengths recorded in 10 mm groups and subsamples were weighed in grams. Scale samples were taken from some fish to estimate length-at-annulus back-calculated from scale measurements. Density estimates expressed as number of fish per unit area of surface water were based on total lengths and average widths of each site sampled. For whirling disease samples, specimens were taken by freezing the entire fish then shipping it to the IDFG fish health laboratory in Eagle, ID.

Brown trout *Salmo trutta* and rainbow trout *Oncorhynchus mykiss* redd counts were conducted on the Big Wood River by walking upstream through the prescribed reach within a week or two after the end of the spawning season. All likely spawning areas within the study reaches were either observed by wading through the reach or from a high prominent place on the bank above the area.

Water temperature was monitored with continuously recording HOBO Boxcar recording thermographs. The thermographs were programmed to record temperatures every 48 minutes for a 60-day duration, then replaced if additional data were needed. Daily mean, maximum and minimum temperatures were calculated from the daily measurements.

## RESULTS AND DISCUSSION

### Big Wood River

### Brown Trout Redd Survey

A spawning ground survey was performed on the Big Wood River upstream of Magic Reservoir to monitor spawning activities of brown trout that had moved upstream from the reservoir. The survey was done on November 16, 1995 by walking upstream looking for redds from the mouth of Rock Creek to the outflow of a private pond on the east side of the Big Wood River approximately 1.5 km upstream of the Stanton Crossing bridge. A total of 117 redds were counted. Redd counts for 1995 within the same reach exceeded those of previous years since 1989 (Table 1). Water temperature at the time of the survey was 8°C.

### Fish Populations

Concerns about whirling disease parasite *Myxosoma cerebralis* led to an investigation by Magic Valley regional and fishery research personnel to determine the presence of the pathogen and its impact on the wild fish population within the Big Wood River drainage. Samples of several wild rainbow trout collected in March from the Big Wood River at Hailey and from Warm Springs Creek, a tributary to the Big Wood River, were sent to the fish pathology lab in Eagle ID. Laboratory results indicated that *M. cerebralis* is present in a small percent of fish within the drainage (Elle 1998).

To determine impacts the pathogen may have on the Big Wood River fish population and to continue monitoring population trends since fishing rules were changed in 1990, we estimated fish populations during the fall of 1995 at five sites that had been sampled in previous years (Table 2, Figure 1; Thurow 1990, Partridge and Warren 1994). Population estimates were made both by combining 100 mm size class estimates and by pooling mark, capture and recapture numbers for all fish $\geq$200 mm to compare estimates made by Thurow (1990) and later studies (Partridge and Warren 1994, 1995; Warren and Partridge 1994).

Total numbers, lengths and weights of fish sampled are given in Tables 3-9. Species sampled include wild and hatchery rainbow trout, brook trout *Salvelinus fontinalis*, mountain whitefish *Prosopium williamsoni*, Wood River sculpin *Cottus leiopomus*, bridgelip sucker *Catostomus columbianus*, and longnose dace *Rhinichthys cataractae*. Population estimate data for each site with corresponding density estimates are given in Table 10 for wild rainbow trout sampled that were greater than or equal to 100 mm long. A comparison of wild rainbow trout population and density estimates for 1995 and previous years is given in Table 11. Percentages and densities of the estimated wild rainbow trout population greater than or equal to 300 mm were calculated for each 100 mm size class for each sample site for all years sampled (Table 12).

Table 1. Brown trout redd counts on the Big Wood River and Rock Creek upstream of Magic Reservoir.

| | Big Wood River[a] | | | | | |
|---|---|---|---|---|---|---|
| Date | Reach 1 | Reach 2 | Reach 3 | Reach 4 | Total | Rock Creek |
| Nov. 19, 1986 | -- | 26 | -[b] | 96 | 122 | -- |
| Nov. 19, 1987 | 104 | 62[c] | -[b] | 30 | 196 | -- |
| Nov. 15, 1988 | 13 | 75 | 31 | 39 | 158 | -- |
| Nov. 18, 1989 | 6 | 20 | 33 | 8 | 67 | 1 |
| Nov. 20, 1990 | 1 | 25 | 30 | 14 | 70 | 0 |
| Nov. 15, 1991 | 3 | 30 | 38 | 15 | 86 | 0 |
| Nov. 19, 1992 | 5 | 14 | 9 | 15 | 43 | 0 |
| Nov. 24, 1993 | 1 | 28 | -[b] | 15 | 43 | 0 |
| Nov. 16, 1994 | 9 | 27 | 56 | 5 | 97 | 0 |
| Nov. 16, 1995 | 2 | 29 | 54 | 32 | 117 | 0 |

[a] Reach 1 - Rock Creek to Sheep Bridge.
Reach 2 - Sheep Bridge to fence at U.S.G.S. station.
Reach 3 - Fence to Stanton Crossing.
Reach 4 - Stanton Crossing to Davis Pond.
Rock Creek - Highway 20 to mouth.

[b] Combined with previous reach.

[c] A total of 42 female brown trout were trapped and spawned from this reach by Hayspur Hatchery in 1987.

Table 2. Stream reach lengths and average widths of electrofishing reaches sampled in the Big Wood River in the fall of 1995.

| | Hailey | Starweather | Gimlet | Lake Creek | Hwy. channel |
|---|---|---|---|---|---|
| | Site 2 | Site 3 | Site 4 | Site 6 | Site 6A |
| Channel type | Meandered | Meandered | Meandered | Meandered | Meandered/ constructed |
| Reach length (m) | 1,858 | 1,002 | 1,455 | 1,208 | 964 |
| Reach area (ha) | 3.71 | 2.10 | 2.87 | 1.89 | 1.51 |
| Mean width (m) | 19.95 | 20.91 | 19.75 | 15.68 | 15.71 |

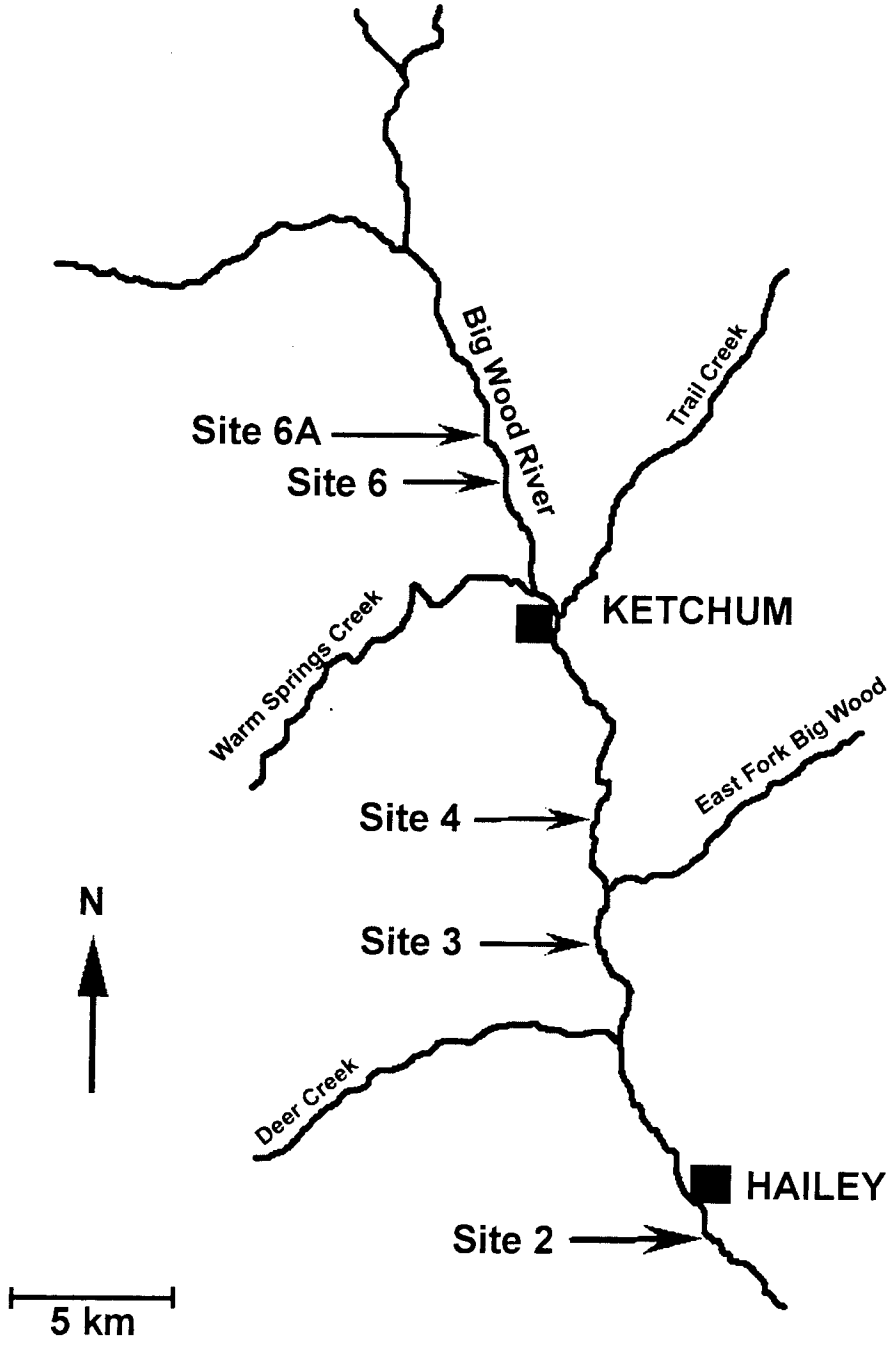


Figure 1. Map of the upper Big Wood River depicting sites sampled in 1995.

Table 3. Total length frequencies (mm) of gamefish sampled in two passes by electrofishing site 2 (at Hailey) on the Big Wood River, September 28 and October 12, 1995. Average weights (g) of a subsample of wild rainbow trout are also given.

| Length Range (mm) | Hatchery rainbow trout | | Wild Rainbow trout | | | | Brook trout | | Mountain whitefish | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Weight | | Length | | Length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % |
| 0-9 | | | | | | | | | | |
| 10-19 | | | | | | | | | | |
| 20-29 | | | | | | | | | | |
| 30-39 | | | | | | | | | | |
| 40-49 | | | | | | | | | | |
| 50-59 | | | 12 | 1.0 | | | | | | |
| 60-69 | | | 19 | 1.5 | | | | | | |
| 70-79 | | | 5 | 0.4 | | | | | 1 | 0.6 |
| 80-89 | | | 3 | 0.2 | | | 3 | 8.3 | 4 | 2.4 |
| 90-99 | | | 6 | 0.5 | 1 | 4 | 3 | 8.3 | 21 | 12.8 |
| 100-109 | | | 28 | 2.2 | | | 4 | 11.1 | 41 | 25.0 |
| 110-119 | | | 60 | 4.8 | | | 1 | 2.8 | 35 | 21.3 |
| 120-129 | | | 88 | 7.0 | | | | | 15 | 9.1 |
| 130-139 | | | 87 | 6.9 | 2 | 23 | 1 | 2.8 | 2 | 1.2 |
| 140-149 | | | 89 | 7.1 | 1 | 26 | | | | |
| 150-159 | | | 85 | 6.7 | 2 | 33 | 1 | 2.8 | | |
| 160-169 | | | 75 | 5.9 | 3 | 40 | 1 | 2.8 | | |
| 170-179 | | | 66 | 5.2 | 2 | 50 | 2 | 5.6 | | |
| 180-189 | | | 46 | 3.6 | 1 | 56 | 2 | 5.6 | | |
| 190-199 | | | 68 | 5.4 | 2 | 61 | 2 | 5.6 | 2 | 1.2 |
| 200-209 | | | 58 | 4.6 | 1 | 76 | 1 | 2.8 | | |
| 210-219 | 1 | 0.8 | 68 | 5.4 | 2 | 85 | 4 | 11.1 | 1 | 0.6 |
| 220-229 | 3 | 2.5 | 54 | 4.3 | 1 | 100 | | | 1 | 0.6 |
| 230-239 | 5 | 4.2 | 49 | 3.9 | 1 | 112 | 3 | 8.3 | 2 | 1.2 |
| 240-249 | 8 | 6.7 | 57 | 4.5 | | | | | 1 | 0.6 |
| 250-259 | 14 | 11.7 | 39 | 3.1 | 1 | 148 | 1 | 2.8 | | |
| 260-269 | 10 | 8.3 | 37 | 2.9 | 2 | 178 | | | | |
| 270-279 | 16 | 13.3 | 24 | 1.9 | 2 | 180 | 1 | 2.8 | | |
| 280-289 | 26 | 21.7 | 23 | 1.8 | 2 | 208 | | | 3 | 1.8 |
| 290-299 | 15 | 12.5 | 14 | 1.1 | 1 | 210 | 2 | 5.6 | 1 | 0.6 |
| 300-309 | 13 | 10.8 | 8 | 0.6 | 1 | 260 | | | 2 | 1.2 |
| 310-319 | 2 | 1.7 | 8 | 0.6 | 1 | 280 | | | 2 | 1.2 |
| 320-329 | 3 | 2.5 | 6 | 0.5 | 1 | 300 | 3 | 8.3 | 10 | 6.1 |
| 330-339 | | | 4 | 0.3 | | | 1 | 2.8 | 2 | 1.2 |
| 340-349 | | | 6 | 0.5 | 1 | 360 | | | | |

Table 3. Continued.

| Length Range (mm) | Hatchery rainbow trout | | Wild Rainbow trout | | | | Brook trout | | Mountain whitefish | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Weight | | Length | | Length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % |
| 350-359 | 2 | 1.7 | 11 | 0.9 | | | | | 1 | 0.6 |
| 360-369 | | | 9 | 0.7 | 1 | 450 | | | | |
| 370-379 | 1 | 0.8 | 3 | 0.2 | | | | | 2 | 1.2 |
| 380-389 | 1 | 0.8 | 10 | 0.8 | | | | | | |
| 390-399 | | | 10 | 0.8 | 2 | 630 | | | 3 | 1.8 |
| 400-409 | | | 6 | 0.5 | | | | | 1 | 0.6 |
| 410-419 | | | 6 | 0.5 | 2 | 645 | | | 3 | 1.8 |
| 420-429 | | | 7 | 0.6 | 2 | 760 | | | 4 | 2.4 |
| 430-439 | | | 2 | 0.2 | | | | | 1 | 0.6 |
| 440-449 | | | 1 | 0.1 | | | | | 1 | 0.6 |
| 450-459 | | | | | | | | | 2 | 1.2 |
| 460-469 | | | 2 | 0.2 | | | | | | |
| 470-479 | | | 2 | 0.2 | 1 | 900 | | | | |
| 480-489 | | | | | | | | | | |
| 490-499 | | | | | | | | | | |
| Number: | 120 | | 1,261 | | | | 36 | | 164 | |
| Avg length: | 276 | | 192 | | | | 187 | | 169 | |
| Total sampled: | 120 | | 1,261 | | | | 36 | | 164 | |

Table 4. Total length frequencies (mm) of nongame fish sampled in two passes by electrofishing site 2 (at Hailey) on the Big Wood River, September 28 and October 12, 1995.

| Length range (mm) | Wood River sculpin | | Bridgelip sucker | |
|---|---|---|---|---|
| | Length | | Length | |
| | no. | % | no. | % |
| 0-9 | | | | |
| 10-19 | | | | |
| 20-29 | | | | |
| 30-39 | | | | |
| 40-49 | | | | |
| 50-59 | 1 | 4.2 | | |
| 60-69 | 3 | 12.5 | | |
| 70-79 | 6 | 25.0 | 3 | 18.8 |
| 80-89 | 5 | 20.8 | | |
| 90-99 | 5 | 20.8 | 2 | 12.5 |
| 100-109 | 4 | 16.7 | 3 | 18.8 |
| 110-119 | | | 4 | 25.0 |
| 120-129 | | | 2 | 12.5 |
| 130-139 | | | 1 | 6.3 |
| 140-149 | | | | |
| 150-159 | | | | |
| 160-169 | | | 1 | 6.3 |
| 170-179 | | | | |
| 180-189 | | | | |
| 190-199 | | | | |
| 200-209 | | | | |
| 210-219 | | | | |
| 220-229 | | | | |
| 230-239 | | | | |
| 240-249 | | | | |
| 250-259 | | | | |
| 260-269 | | | | |
| 270-279 | | | | |
| 280-289 | | | | |
| 290-299 | | | | |
| Number: | 24 | | 16 | |
| Avg length: | 81 | | 107.38 | |
| Total sampled: | 305 | | 17 | |

Table 5. Total length frequencies (mm) of fish sampled in two passes by electrofishing site 3 (at Starweather) on the Big Wood River, September 26 and October 10, 1995. Average weights (g) of a subsample of wild rainbow trout are also given.

| Length range (mm) | Hatchery rainbow trout | | Wild rainbow trout | | | | Brook trout | | Mountain whitefish | | Wood River sculpin | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | length | | length | | weight | | length | | length | | length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % | no. | % |
| 0-9 | | | | | | | | | | | | |
| 10-19 | | | | | | | | | | | | |
| 20-29 | | | | | | | | | | | | |
| 30-39 | | | 1 | 0.1 | | | | | | | | |
| 40-49 | | | 18 | 2.4 | | | | | 1 | 1.9 | | |
| 50-59 | | | 27 | 3.7 | | | | | | | | |
| 60-69 | | | 34 | 4.6 | | | | | | | 1 | 1.7 |
| 70-79 | | | 10 | 1.4 | | | | | | | 8 | 13.6 |
| 80-89 | | | 7 | 1.0 | 1 | 7 | 2 | 16.7 | 3 | 5.6 | 9 | 15.3 |
| 90-99 | | | 10 | 1.4 | 1 | 7 | 4 | 33.3 | 2 | 3.7 | 16 | 27.1 |
| 100-109 | | | 33 | 4.5 | 1 | 11 | 5 | 41.7 | 4 | 7.4 | 12 | 20.3 |
| 110-119 | | | 69 | 9.4 | 2 | 14 | | | 15 | 27.8 | 10 | 16.9 |
| 120-129 | | | 67 | 9.1 | 2 | 116 | | | 7 | 13.0 | 3 | 5.1 |
| 130-139 | | | 66 | 9.0 | 2 | 22 | | | 4 | 7.4 | | |
| 140-149 | | | 47 | 6.4 | 1 | 26 | | | | | | |
| 150-159 | | | 38 | 5.2 | | | | | | | | |
| 160-169 | | | 32 | 4.4 | 2 | 45 | | | | | | |
| 170-179 | | | 19 | 2.6 | 2 | 44 | | | | | | |
| 180-189 | | | 13 | 1.8 | | | | | | | | |
| 190-199 | | | 18 | 2.4 | 2 | 63 | | | | | | |
| 200-209 | | | 24 | 3.3 | 2 | 72 | | | | | | |
| 210-219 | | | 17 | 2.3 | | | | | | | | |
| 220-229 | | | 9 | 1.2 | 2 | 109 | | | 2 | 3.7 | | |
| 230-239 | | | 13 | 1.8 | 3 | 111 | | | 2 | 3.7 | | |
| 240-249 | | | 16 | 2.2 | 1 | 140 | | | | | | |

Table 5. Continued.

| Length range (mm) | Hatchery rainbow trout length | | Wild rainbow trout length | | Wild rainbow trout weight | | Brook trout length | | Mountain whitefish length | | Wood River sculpin length | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | no. | % | no. | % | no. | avg. | no. | % | no. | % | no. | % |
| 250-259 | 1 | 100.0 | 17 | 2.3 | 1 | 144 | | | | | | |
| 260-269 | | | 17 | 2.3 | 1 | 145 | | | | | | |
| 270-279 | | | 11 | 1.5 | 2 | 189 | | | | | | |
| 280-289 | | | 6 | 0.8 | 1 | 194 | 1 | 8.3 | | | | |
| 290-299 | | | 6 | 0.8 | 2 | 216 | | | 1 | 1.9 | | |
| 300-309 | | | 2 | 0.3 | | | | | 1 | 1.9 | | |
| 310-319 | | | 4 | 0.5 | 3 | 263 | | | 1 | 1.9 | | |
| 320-329 | | | 6 | 0.8 | 1 | 340 | | | | | | |
| 330-339 | | | 4 | 0.5 | 1 | 335 | | | 1 | 1.9 | | |
| 340-349 | | | 8 | 1.1 | 1 | 390 | | | | | | |
| 350-359 | | | 10 | 1.4 | 2 | 418 | | | | | | |
| 360-369 | | | 9 | 1.2 | 3 | 483 | | | | | | |
| 370-379 | | | 10 | 1.4 | | | | | | | | |
| 380-389 | | | 9 | 1.2 | 2 | 550 | | | 1 | 1.9 | | |
| 390-399 | | | 7 | 1.0 | 2 | 630 | | | 3 | 5.6 | | |
| 400-409 | | | 9 | 1.2 | 4 | 610 | | | | | | |
| 410-419 | | | 3 | 0.4 | 2 | 635 | | | | | | |
| 420-429 | | | 5 | 0.7 | 2 | 692 | | | 2 | 3.7 | | |
| 430-439 | | | 2 | 0.3 | 2 | 635 | | | 2 | 3.7 | | |
| 440-449 | | | | | | | | | 1 | 1.9 | | |
| 450-459 | | | 1 | 0.1 | 1 | 660 | | | | | | |
| 460-469 | | | | | | | | | | | | |
| 470-479 | | | 1 | 0.1 | 1 | 920 | | | 1 | 1.9 | | |
| 480-489 | | | | | | | | | | | | |
| 490-499 | | | | | | | | | | | | |
| Number: | 1 | | 735 | | | | 12 | | 54 | | 59 | |
| Avg | 255 | | 173 | | | | 109 | | 184 | | 85 | |
| Total sampled: | 1 | | 735 | | | | 12 | | 54 | | 133 | |

Table 6. Total length frequencies (mm) of gamefish sampled in two passes by electrofishing site 4 (at Gimlet subdivision) on the Big Wood River, September 25 and October 11, 1995. Average weights (g) of a subsample of wild rainbow trout are also given.

| Length range (mm) | Hatchery rainbow trout | | Wild rainbow trout | | | | Brook trout | | Mountain whitefish | |
|---|---|---|---|---|---|---|---|---|---|---|
| | length | | length | | weight | | length | | length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % |
| 0-9 | | | | | | | | | | |
| 10-19 | | | | | | | | | | |
| 20-29 | | | | | | | | | | |
| 30-39 | | | 2 | 0.1 | | | | | | |
| 40-49 | | | 27 | 2.0 | | | | | | |
| 50-59 | | | 45 | 3.4 | | | | | 1 | 0.9 |
| 60-69 | | | 19 | 1.4 | | | 1 | 3.4 | 1 | 0.9 |
| 70-79 | | | 7 | 0.5 | | | | | 9 | 8.3 |
| 80-89 | | | 4 | 0.3 | | | 3 | 10.3 | 3 | 2.8 |
| 90-99 | | | 17 | 1.3 | 1 | 8 | 4 | 13.8 | 7 | 6.4 |
| 100-109 | | | 38 | 2.8 | 2 | 11 | | | 21 | 19.3 |
| 110-119 | | | 58 | 4.3 | 1 | 14 | 2 | 6.9 | 16 | 14.7 |
| 120-129 | | | 77 | 5.8 | 4 | 17 | | | 3 | 2.8 |
| 130-139 | | | 75 | 5.6 | 2 | 20 | | | 2 | 1.8 |
| 140-149 | | | 69 | 5.2 | 2 | 27 | | | | |
| 150-159 | | | 57 | 4.3 | | | 1 | 3.4 | | |
| 160-169 | | | 48 | 3.6 | 1 | 48 | | | | |
| 170-179 | | | 42 | 3.1 | | | 2 | 6.9 | 1 | 0.9 |
| 180-189 | | | 44 | 3.3 | 2 | 52 | | | | |
| 190-199 | | | 37 | 2.8 | 1 | 74 | | | | |
| 200-209 | | | 30 | 2.2 | | | 4 | 13.8 | 1 | 0.9 |
| 210-219 | | | 30 | 2.2 | 1 | 98 | | | 2 | 1.8 |
| 220-229 | | | 36 | 2.7 | 1 | 102 | | | | |
| 230-239 | | | 30 | 2.2 | 1 | 124 | 1 | 3.4 | 1 | 0.9 |
| 240-249 | | | 25 | 1.9 | | | 1 | 3.4 | 1 | 0.9 |
| 250-259 | | | 37 | 2.8 | | | | | | |
| 260-269 | | | 34 | 2.5 | 4 | 179 | 1 | 3.4 | | |
| 270-279 | | | 21 | 1.6 | 3 | 196 | 1 | 3.4 | 1 | 0.9 |
| 280-289 | | | 27 | 2.0 | | | 0 | 0.0 | 3 | 2.8 |
| 290-299 | | | 18 | 1.3 | 1 | 255 | 2 | 6.9 | 1 | 0.9 |

Table 6. Continued.

| Length range (mm) | Hatchery rainbow trout | | Wild rainbow trout | | | | Brook trout | | Mountain whitefish | |
|---|---|---|---|---|---|---|---|---|---|---|
| | length | | length | | weight | | length | | length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % |
| 300-309 | | | 24 | 1.8 | 1 | 270 | | | 3 | 2.8 |
| 310-319 | | | 12 | 0.9 | 1 | 245 | | | 2 | 1.8 |
| 320-329 | 1 | 50.0 | 26 | 1.9 | 2 | 343 | 1 | 3.4 | 2 | 1.8 |
| 330-339 | 1 | 50.0 | 19 | 1.4 | 3 | 343 | 1 | 3.4 | 2 | 1.8 |
| 340-349 | | | 36 | 2.7 | 2 | 420 | | | 1 | 0.9 |
| 350-359 | | | 29 | 2.2 | | | | | 2 | 1.8 |
| 360-369 | | | 39 | 2.9 | 3 | 457 | 1 | 3.4 | 1 | 0.9 |
| 370-379 | | | 38 | 2.8 | 3 | 511.7 | 1 | 3.4 | 2 | 1.8 |
| 380-389 | | | 35 | 2.6 | 2 | 585 | | | 2 | 1.8 |
| 390-399 | | | 38 | 2.8 | 2 | 605 | | | | |
| 400-409 | | | 30 | 2.2 | 3 | 605 | | | 1 | 0.9 |
| 410-419 | | | 19 | 1.4 | 1 | 650 | 2 | 6.9 | 1 | 0.9 |
| 420-429 | | | 24 | 1.8 | 4 | 730 | | | 3 | 2.8 |
| 430-439 | | | 7 | 0.5 | | | | | 2 | 1.8 |
| 440-449 | | | 4 | 0.3 | | | | | 1 | 0.9 |
| 450-459 | | | | | | | | | 7 | 6.4 |
| 460-469 | | | 1 | 0.1 | | | | | 1 | 0.9 |
| 470-479 | | | | | | | | | 1 | 0.9 |
| 480-489 | | | | | | | | | 1 | 0.9 |
| 490-499 | | | 3 | 0.2 | 2 | 1,200 | | | | |
| Number: | 2 | | 1,338 | | | | 29 | | 109 | |
| Avg length: | 325 | | 223 | | | | 207 | | 208 | |
| Total sampled: | 2 | | 1,338 | | | | 29 | | 109 | |

Table 7. Total length frequencies (mm) of nongame fish sampled in two passes by electrofishing site 4 (at Gimlet subdivision) on the Big Wood River, September 25 and October 11, 1995.

| Length range (mm) | Wood River sculpin length | | Bridgelip sucker length | | Longnose dace length | |
|---|---|---|---|---|---|---|
| | no. | % | no. | % | no. | % |
| 0-9 | | | | | | |
| 10-19 | | | | | | |
| 20-29 | | | | | | |
| 30-39 | | | | | | |
| 40-49 | | | | | | |
| 50-59 | | | | | | |
| 60-69 | 5 | 15.2 | 1 | 25.0 | 1 | 100.0 |
| 70-79 | 11 | 33.3 | | | | |
| 80-89 | 6 | 18.2 | | | | |
| 90-99 | 8 | 24.2 | | | | |
| 100-109 | 3 | 9.1 | 1 | 25.0 | | |
| 110-119 | | | 1 | 25.0 | | |
| 120-129 | | | 1 | 25.0 | | |
| 130-139 | | | | | | |
| 140-149 | | | | | | |
| 150-159 | | | | | | |
| 160-169 | | | | | | |
| 170-179 | | | | | | |
| 180-189 | | | | | | |
| 190-199 | | | | | | |
| 200-209 | | | | | | |
| 210-219 | | | | | | |
| 220-229 | | | | | | |
| 230-239 | | | | | | |
| 240-249 | | | | | | |
| 250-259 | | | | | | |
| 260-269 | | | | | | |
| 270-279 | | | | | | |
| 280-289 | | | | | | |
| 290-299 | | | | | | |
| Number: | 33 | | 4 | | 1 | |
| Avg length: | 80.9 | | 98.25 | | 60 | |
| Total sampled: | 63 | | 4 | | 1 | |

Table 8. Total length frequencies (mm) of fish sampled in two passes by electrofishing Site 6 (Hulen Meadows) on the Big Wood River, September 27 and October 13, 1995.

| Length range (mm) | Hatchery rainbow trout length | | Wild rainbow trout length | | Brook trout length | | Mountain whitefish length | | Wood River sculpin length | |
|---|---|---|---|---|---|---|---|---|---|---|
| | no. | % | no. | % | no. | % | no. | % | no. | % |
| 0-9 | | | | | | | | | | |
| 10-19 | | | | | | | | | | |
| 20-29 | | | | | | | | | | |
| 30-39 | | | | | | | | | | |
| 40-49 | | | 4 | 1.0 | | | | | | |
| 50-59 | | | 20 | 5.0 | | | | | 1 | 12.5 |
| 60-69 | | | 8 | 2.0 | 3 | 11.1 | | | 3 | 37.5 |
| 70-79 | | | 2 | 0.5 | 5 | 18.5 | 4 | 7.0 | 1 | 12.5 |
| 80-89 | | | | | 2 | 7.4 | 2 | 3.5 | | |
| 90-99 | | | 8 | 2.0 | 2 | 7.4 | | | 3 | 37.5 |
| 100-109 | | | 29 | 7.2 | 1 | 3.7 | 6 | 10.5 | | |
| 110-119 | | | 30 | 7.5 | | | 2 | 3.5 | | |
| 120-129 | | | 38 | 9.5 | | | 4 | 7.0 | | |
| 130-139 | | | 43 | 10.7 | 1 | 3.7 | | | | |
| 140-149 | | | 31 | 7.7 | | | | | | |
| 150-159 | | | 24 | 6.0 | 4 | 14.8 | | | | |
| 160-169 | | | 16 | 4.0 | 4 | 14.8 | 1 | 1.8 | | |
| 170-179 | | | 17 | 4.2 | | | | | | |
| 180-189 | | | 7 | 1.7 | 3 | 11.1 | | | | |
| 190-199 | | | 11 | 2.7 | 1 | 3.7 | | | | |
| 200-209 | | | 14 | 3.5 | | | | | | |
| 210-219 | | | 9 | 2.2 | | | | | | |
| 220-229 | | | 8 | 2.0 | 1 | 3.7 | | | | |
| 230-239 | | | 6 | 1.5 | | | 1 | 1.8 | | |
| 240-249 | | | 4 | 1.0 | | | | | | |
| 250-259 | | | 3 | 0.7 | | | 2 | 3.5 | | |
| 260-269 | 2 | 66.7 | 5 | 1.2 | | | | | | |
| 270-279 | 1 | 33.3 | 3 | 0.7 | | | | | | |
| 280-289 | | | 5 | 1.2 | | | | | | |
| 290-299 | | | 5 | 1.2 | | | | | | |
| 300-309 | | | 5 | 1.2 | | | | | | |
| 310-319 | | | 3 | 0.7 | | | | | | |
| 320-329 | | | | | | | 1 | 1.8 | | |
| 330-339 | | | 3 | 0.7 | | | 2 | 3.5 | | |
| 340-349 | | | | | | | 1 | 1.8 | | |

Table 8. Continued.

| Length range (mm) | Hatchery rainbow trout length no. | % | Wild rainbow trout length no. | % | Brook trout length no. | % | Mountain whitefish length no. | % | Wood River sculpin length no. | % |
|---|---|---|---|---|---|---|---|---|---|---|
| 350-359 | | | 2 | 0.5 | | | 3 | 5.3 | | |
| 360-369 | | | 1 | 0.2 | | | 2 | 3.5 | | |
| 370-379 | | | 2 | 0.5 | | | 6 | 10.5 | | |
| 380-389 | | | 5 | 1.2 | | | 2 | 3.5 | | |
| 390-399 | | | 9 | 2.2 | | | 3 | 5.3 | | |
| 400-409 | | | 5 | 1.2 | | | 2 | 3.5 | | |
| 410-419 | | | 4 | 1.0 | | | 3 | 5.3 | | |
| 420-429 | | | 3 | 0.7 | | | 4 | 7.0 | | |
| 430-439 | | | 2 | 0.5 | | | 3 | 5.3 | | |
| 440-449 | | | | | | | 1 | 1.8 | | |
| 450-459 | | | 2 | 0.5 | | | 2 | 3.5 | | |
| 460-469 | | | 4 | 1.0 | | | | | | |
| 470-479 | | | | | | | | | | |
| 480-489 | | | 1 | 0.2 | | | | | | |
| 490-499 | | | | | | | | | | |
| Number: | 3 | | 401 | | 27 | | 57 | | 8 | |
| Avg length: | 265 | | 166.5 | | 134 | | 287 | | 73.1 | |
| Total sampled: | 3 | | 401 | | 27 | | 57 | | 143 | |

Table 9. Total length frequencies (mm) of gamefish sampled in two passes by electrofishing Site 6A (at the Highway Diversion) on the Big Wood River, September 27 and October 13, 1995. Average weights (g) of a subsample of wild rainbow trout are also given.

| Length range | Hatchery rainbow trout | | Wild rainbow trout | | | | Brook trout | | Mountain whitefish | | Wood River sculpin | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Weight | | Length | | Length | | Length | |
| (mm) | no. | % | no. | % | no. | avg. | no. | % | no. | % | no. | % |
| 0-9 | | | | | | | | | | | | |
| 10-19 | | | | | | | | | | | | |
| 20-29 | | | | | | | | | | | | |
| 30-39 | | | 1 | 0.2 | | | | | | | | |
| 40-49 | | | 3 | 0.6 | | | | | | | 1 | 3.4 |
| 50-59 | | | 2 | 0.4 | | | | | | | 2 | 6.9 |
| 60-69 | | | | | | | 1 | 8.3 | 4 | 4.9 | 6 | 20.7 |
| 70-79 | | | 5 | 1.0 | | | | | 14 | 17.3 | 5 | 17.2 |
| 80-89 | | | 18 | 3.5 | | | 1 | 8.3 | 2 | 2.5 | 3 | 10.3 |
| 90-99 | | | 39 | 7.5 | | | 3 | 25.0 | | | 3 | 10.3 |
| 100-109 | | | 67 | 13.0 | 1 | 10 | 4 | 33.3 | | | 4 | 13.8 |
| 110-119 | | | 56 | 10.8 | | | 1 | 8.3 | 5 | 6.2 | 3 | 10.3 |
| 120-129 | | | 56 | 10.8 | 1 | 20 | | | | | 2 | 6.9 |
| 130-139 | | | 40 | 7.7 | | | | | 1 | 1.2 | | |
| 140-149 | | | 40 | 7.7 | 1 | 28 | | | | | | |
| 150-159 | | | 19 | 3.7 | 1 | 33 | | | 3 | 3.7 | | |
| 160-169 | | | 15 | 2.9 | 1 | 46 | | | 2 | 2.5 | | |
| 170-179 | | | 15 | 2.9 | 1 | 48 | 1 | 8.3 | 3 | 3.7 | | |
| 180-189 | | | 9 | 1.7 | | | | | 1 | 1.2 | | |
| 190-199 | | | 5 | 1.0 | 1 | 62 | | | | | | |

Table 9. Continued.

| Length range (mm) | Hatchery rainbow trout | | Wild rainbow trout | | | | Brook trout | | Mountain whitefish | | Wood River sculpin | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Weight | | Length | | Length | | Length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % | no. | % |
| 200-209 | | | 11 | 2.1 | 2 | 82 | | | | | | |
| 210-219 | | | 11 | 2.1 | 2 | 102 | | | 1 | 1.2 | | |
| 220-229 | | | 10 | 1.9 | 1 | 108 | | | 2 | 2.5 | | |
| 230-239 | 2 | 22.2 | 6 | 1.2 | 1 | 140 | | | 2 | 2.5 | | |
| 240-249 | | | 10 | 1.9 | | | 1 | 8.3 | 1 | 1.2 | | |
| 250-259 | | | 9 | 1.7 | 2 | 163 | | | | | | |
| 260-269 | | | 11 | 2.1 | 1 | 180 | | | 1 | 1.2 | | |
| 270-279 | | | 3 | 0.6 | | | | | 1 | 1.2 | | |
| 280-289 | 2 | 22.2 | 3 | 0.6 | | | | | | | | |
| 290-299 | 2 | 22.2 | 4 | 0.8 | | | | | | | | |
| 300-309 | | | 2 | 0.4 | 1 | 260 | | | | | | |
| 310-319 | 1 | 11.1 | 4 | 0.8 | | | | | | | | |
| 320-329 | 1 | 11.1 | 4 | 0.8 | 1 | 345 | | | | | | |
| 330-339 | | | 5 | 1.0 | 1 | 425 | | | 1 | 1.2 | | |
| 340-349 | | | 3 | 0.6 | | | | | | | | |
| 350-359 | 1 | 11.1 | 1 | 0.2 | | | | | 1 | 1.2 | | |
| 360-369 | | | 5 | 1.0 | 3 | 495 | | | 3 | 3.7 | | |
| 370-379 | | | 4 | 0.8 | | | | | 5 | 6.2 | | |
| 380-389 | | | 3 | 0.6 | 1 | 545 | | | 6 | 7.4 | | |
| 390-399 | | | 6 | 1.2 | 1 | 565 | | | | | | |

Table 9. Continued.

| Length range (mm) | Hatchery rainbow trout | | Wild rainbow trout | | | | Brook trout | | Mountain whitefish | | Wood River sculpin | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Weight | | Length | | Length | | Length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % | no. | % |
| 400-409 | | | | | | | | | 5 | 6.2 | | |
| 410-419 | | | 4 | 0.8 | | | | | 5 | 6.2 | | |
| 420-429 | | | 1 | 0.2 | | | | | 5 | 6.2 | | |
| 430-439 | | | 2 | 0.4 | 1 | 740 | | | 2 | 2.5 | | |
| 440-449 | | | 2 | 0.4 | 2 | 870 | | | 4 | 4.9 | | |
| 450-459 | | | 2 | 0.4 | 1 | 1,000 | | | 1 | 1.2 | | |
| 460-469 | | | | | | | | | | | | |
| 470-479 | | | | | | | | | | | | |
| 480-489 | | | | | | | | | | | | |
| 490-499 | | | | | | | | | | | | |
| 500-509 | | | 1 | 0.2 | 1 | 1,175 | | | | | | |
| Number: | 9 | | 517 | | | | 12 | | 81 | | 29 | |
| Avg length: | 289.4 | | 162.7 | | | | 114 | | 256 | | 83.1 | |
| Total sampled: | 9 | | 517 | | | | 12 | | 81 | | 79 | |

Table 10. Population estimates and densities of wild rainbow trout (≥100 mm) by size classes in the Big Wood River during 1995.

| Reach/ size(mm) | Number marked | Number caught | Number recaptured | Population estimate | 95% CI | No. 100 | No./ha |
|---|---|---|---|---|---|---|---|
| Hailey, 2 | | | | | | | |
| 100-199 | 329 | 361 | 52 | 2,254 | ±555 | 121.5 | 607 |
| 200-299 | 249 | 174 | 47 | 911 | ±217 | 49.0 | 245 |
| 300-399 | 40 | 35 | 14 | 98 | ±37 | 5.3 | 26 |
| 400-499 | 13 | 13 | 7 | 25 | ±10 | 1.3 | 7 |
| SUM (≥200) | | | | 1,034 | ±221 | 55.6 | 278 |
| ALL ≥200 | 302 | 222 | 68 | 979 | ±191 | 52.7 | 263 |
| Starweather, 3 | | | | | | | |
| 100-199 | 225 | 175 | 43 | 904 | ±229 | 90.2 | 430 |
| 200-299 | 84 | 51 | 15 | 276 | ±109 | 27.5 | 131 |
| 300-399 | 38 | 31 | 10 | 113 | ±52 | 11.3 | 54 |
| 400-499 | 8 | 13 | 2 | 42 | ±36 | 4.2 | 20 |
| SUM (≥200) | | | | 431 | ±126 | 43.0 | 205 |
| ALL ≥200 | 130 | 95 | 27 | 449 | ±138 | 44.7 | 213 |
| Gimlet, 4 | | | | | | | |
| 100-199 | 261 | 281 | 49 | 1478 | ±368 | 101.6 | 515 |
| 200-299 | 139 | 149 | 43 | 477 | ±117 | 32.8 | 166 |
| 300-399 | 127 | 169 | 52 | 411 | ±91 | 28.2 | 143 |
| 400-499 | 34 | 54 | 18 | 101 | ±36 | 6.9 | 35 |
| SUM (≥200) | | | | 989 | ±153 | 68.0 | 344 |
| ALL ≥200 | 300 | 372 | 113 | 985 | ±150 | 67.7 | 343 |
| Lake Creek, 6 | | | | | | | |
| 100-199 | 100 | 129 | 26 | 486 | ±160 | 40.2 | 257 |
| 200-299 | 34 | 19 | 6 | 100 | ±56 | 8.2 | 53 |
| 300-399 | 17 | 13 | 5 | 42 | ±24 | 3.5 | 22 |
| 400-499 | 9 | 7 | 1 | 40 | ±39 | 3.3 | 21 |
| SUM (≥200) | | | | 182 | ±72 | 15.1 | 96 |
| ALL ≥200 | 60 | 39 | 12 | 188 | ±81 | 15.6 | 99 |

Table 10. Continued.

| Reach/ size(mm) | Number marked | Number caught | Number recaptured | Population estimate | 95% CI | No. 100 | No./ha |
|---|---|---|---|---|---|---|---|
| Highway Channel, 6A | | | | | | | |
| 100-199 | 175 | 142 | 37 | 662 | ±178 | 68.7 | 438 |
| 200-299 | 43 | 35 | 10 | 144 | ±68 | 14.9 | 95 |
| 300-399 | 19 | 18 | 4 | 76 | ±52 | 7.9 | 50 |
| 400-499 | 5 | 6 | 1 | 21 | ±20 | 2.3 | 14 |
| 500 | 0 | 1 | 0 | -- | -- | --- | -- |
| SUM (≥200) | | | | 241 | ±20 | 25.0 | 160 |
| ALL ≥200 | 67 | 60 | 15 | 259 | ±106 | 26.9 | 172 |

Table 11. Estimated wild rainbow trout (≥200 mm) populations and densities in the Big Wood River. Data from 1986-1988 is from Thurow (1990).

| Site | Year | Season | Pop. estimate | 95% CI | Trout/100 m | Trout/ha |
|---|---|---|---|---|---|---|
| 2 | 1986 | Summer | 352 | 218-598 | 17.6 | 97 |
| | 1987 | Summer | 544 | 292-1113 | 27.2 | 177 |
| | 1987 | Fall | 583 | 338-1093 | 29.2 | 189 |
| | 1988 | Summer | 1,038 | 749-1483 | 51.9 | 353 |
| | 1992 | Fall | 974 | 834-1114 | 48.7 | 331 |
| | 1995 | Fall | 979 | 789-1170 | 52.7 | 263 |
| 3 | 1986 | Summer | 460 | 254-920 | 43.1 | 211 |
| | 1986 | Fall | 81 | 42-171 | 7.6 | 37 |
| | 1987 | Summer | 244 | 147-433 | 22.9 | 137 |
| | 1987 | Fall | 220 | 128-413 | 20.6 | 123 |
| | 1988 | Summer | 392 | 278-569 | 36.7 | 232 |
| | 1991 | Summer | 547 | 350-743 | 45.3 | 191 |
| | 1993 | Fall | 329 | 221-437 | 30.7 | 92 |
| | 1995 | Fall | 466 | 320-612 | 46.5 | 222 |
| 4 | 1986 | Summer | 675 | 431-1898 | 34.1 | 197 |
| | 1986 | Fall | 455 | 258-878 | 23.0 | 133 |
| | 1987 | Summer | 955 | 609-1577 | 48.3 | 318 |
| | 1987 | Fall | 301 | 187-512 | 15.2 | 100 |
| | 1988 | Summer | 808 | 601-1111 | 40.8 | 276 |
| | 1992[a] | Fall | 895 | 713-1077 | 79.9 | 406 |
| | 1993 | Fall | 1,001 | 770-1232 | 64.2 | 326 |
| | 1995 | Fall | 985 | 835-1135 | 67.8 | 343 |
| 6 | 1986 | Summer | 125 | 73-235 | 10.9 | 72 |
| | 1986 | Fall | 168 | 107-277 | 14.6 | 97 |
| | 1987 | Summer | 176 | 83-405 | 15.3 | 104 |
| | 1987 | Fall | 161 | 97-285 | 14.0 | 95 |
| | 1988 | Summer | 90 | 50-180 | 7.8 | 54 |
| | 1990[b] | Fall | 199 | 141-289 | 12.1 | 86 |
| | 1991 | Summer | 132 | 94-171 | 11.4 | 81 |
| | 1992 | Fall | 209 | 171-243 | 18.2 | 129 |
| | 1993 | Fall | 213 | 141-285 | 17.3 | 118 |
| | 1995 | Fall | 188 | 106-268 | 15.5 | 100 |
| 6A | 1991 | Summer | 126 | 63-189 | 12.9 | 86 |
| | 1992 | Fall | 113 | 85-141 | 11.6 | 77 |
| | 1993 | Fall | 269 | 174-364 | 25.2 | 174 |
| | 1995 | Fall | 259 | 153-365 | 26.9 | 172 |

[a] Section length reduced due to low river flows.
[b] Includes portion of old highway river site - Section length estimated to be 1.65 km and area of 2.32 ha.

Table 12. Estimated percentages and numbers of wild rainbow trout (≥200 mm only) which exceeded 300, 400, and 500 mm in the Big Wood River. Estimates from 1986-1988 adjusted for sampling efficiency (Thurow 1990).

| | | Percent | | | Wild rainbow trout/km | | |
|---|---|---|---|---|---|---|---|
| Year | Reach | ≥300 | ≥400 | ≥500 | ≥300 | ≥400 | ≥500 |
| 1986-1988[a] | 2,3,4[a] | 21 | 5 | <0.1 | 76 | 17 | 0.2 |
| 1991 | 3 | 27 | 7 | 0 | 125 | 31 | 0 |
| 1992 | 2 | 10 | 1 | 0 | 51 | 4 | 0 |
| 1992 | 4 | 50 | 12 | 0 | 226 | 57 | 0 |
| 1993 | 3 | 28 | 8 | 0 | 82 | 22 | 0 |
| 1993 | 4 | 40 | 15 | 0 | 258 | 97 | 0 |
| 1995 | 2 | 12 | 2 | 0 | 66 | 13 | 0 |
| 1995 | 3 | 36 | 10 | 0 | 155 | 42 | 0 |
| 1995 | 4 | 52 | 10 | 0 | 352 | 69 | 0 |
| 1986-1988[a] | 6 | 27 | 4 | 0.4 | 30 | 5 | 0.4 |
| 1990 | 6[b] | 29 | 7 | 0 | 35 | 8 | 0 |
| 1991 | 6 | 21 | 5 | 0 | 23 | 5 | 0 |
| 1992 | 6 | 29 | 8 | 0 | 51 | 14 | 0 |
| 1993 | 6 | 25 | 2 | 0 | 51 | 5 | 0 |
| 1995 | 6 | 45 | 22 | 0 | 68 | 33 | 0 |
| 1991 | 6A | 13 | 4 | 0 | 18 | 6 | 0 |
| 1992 | 6A | 11 | 0 | 0 | 13 | 0 | 0 |
| 1993 | 6A | 17 | 1 | 0 | 45 | 4 | 0 |
| 1995 | 6A | 40 | 9 | 0 | 101 | 22 | 0 |

[a] Pooled data.
[b] Includes a portion of old highway river site, total sample length estimated to be 1.65 km.

A subsample of wild rainbow trout was observed for hook scars and the presence and incidence of the *Salmincola* sp. parasitic copepod on the gills (Table 13). Results indicate that the parasite is present on fish at all sites and that hook scars are more prevalent on fish within the catch and release area although some fish within all sites had scarring. All fish from the fall 1995 sample that were sent to the lab for pathological examination were negative for *M. cerebralis*. Although *M. cerebralis* was found in spring samples, there does not appear to be any impact on the trout population in the Big Wood River at this time.

Population and density estimates for brook trout and mountain whitefish are given in Table 14 for fish in 100 mm size classes that were greater than or equal to 100 mm. In several size classes there were not enough fish sampled for a population estimate, and many of the 95% confidence levels reflect the low numbers of fish sampled at some of the sites.

Table 13. Percent of wild rainbow trout with observed hook scars and attached parasitic copepods in the Big Wood River in 1995.

| Site | Sample size | Hook scars | Number of parasites on gills | | | |
|---|---|---|---|---|---|---|
| | | | 0 | 1-3 | 4-6 | $7^{+}$ |
| 2 (Hailey) | 40 | 25% | 58% | 37% | 5% | 0% |
| 3 (Starweather) | 49 | 35% | 31% | 33% | 18% | 18% |
| 4 (Gimlet) | 52 | 46% | 52% | 31% | 15% | 2% |
| 6 (Lake Creek) | No samples taken | | | | | |
| 6A (Highway Channel) | 42 | 17% | 59% | 22% | 5% | 14% |

## Billingsley Creek

Billingsley Creek is a spring fed stream that flows northward below the Snake River canyon rim from its origin approximately 1 km east of the Hagerman State Fish Hatchery to Lower Salmon Falls Reservoir approximately 1.2 km upriver of the dam. The stream flows for approximately 2.7 km through the Billingsley Creek Wildlife Management Area (WMA) northeast of the town of Hagerman. The average width of the stream through the WMA is approximately 20.1 m. Billingsley Creek fish were sampled by daytime electrofishing on April 27 and May 11, 1995 through the entire length of the WMA. The reach was floated with a drift boat equipped with the Coffelt VVP-15 electrofishing outfit. On April 27 all gamefish species sampled that were at least 100 mm long were marked with an upper caudal fin punch for an adjusted (Chapman) Peterson Mark-Recapture population estimate (Ricker 1975). All fish stunned were netted regardless of species for approximately three-fourths of the time electrofished. Water temperature was 15°C on both sampling days.

Table 14. Population and density estimates of brook trout and mountain whitefish (≥100 mm) by size classes in the Big Wood River during 1995.

| Reach/ size (mm) | Number marked | Number caught | Number recaptured | Population estimate | 95% CI | Number/ 100 m | Number/ ha |
|---|---|---|---|---|---|---|---|
| | | | Mountain whitefish | | | | |
| Hailey, 2 | | | | | | | |
| 100-199 | 12 | 83 | 1 | 546 | ±610 | 29.4 | 147 |
| 200-299 | 4 | 5 | 1 | 15 | ±14 | 0.8 | 4 |
| 300-399 | 16 | 6 | 4 | 24 | ±10 | 1.3 | 6 |
| 400-499 | 7 | 5 | 4 | 10 | ±3 | 0.5 | 3 |
| SUM (≥200) | | | | 48 | ±17 | 2.6 | 13 |
| ALL ≥200 | 27 | 16 | 9 | 48 | ±18 | 2.6 | 13 |
| Starweather, 3 | | | | | | | |
| 100-199 | 16 | 10 | 0 | -[a] | | | |
| 200-299 | 4 | 1 | 0 | -[a] | | | |
| 300-399 | 1 | 6 | 3[b] | | | | |
| 400-499 | 3 | 3 | 1 | 8 | ±6 | 0.8 | 4 |
| ALL ≥200 | 8 | 10 | 4 | 20 | ±12 | 2.0 | 10 |
| Gimlet, 4 | | | | | | | |
| 100-199 | 27 | 15 | 0 | -[a] | | | |
| 200-299 | 6 | 4 | 1 | 18 | ±15 | 1.2 | 6 |
| 300-399 | 11 | 6 | 3 | 21 | ±12 | 1.4 | 7 |
| 400-499 | 9 | 9 | 3 | 25 | ±17 | 1.7 | 9 |
| SUM (≥200) | | | | 64 | ±26 | 4.4 | 22 |
| ALL ≥200 | 26 | 19 | 7 | 68 | ±34 | 4.7 | 24 |
| Lake Creek, 6 | | | | | | | |
| 100-199 | 20 | 18 | 2 | 133 | ±120 | 11.0 | 70 |
| 200-299 | 3 | 0 | 0 | -[a] | | | |
| 300-399 | 11 | 9 | 1 | 60 | ±61 | 5.0 | 32 |
| 400-499 | 6 | 9 | 1 | 35 | ±35 | 2.9 | 18 |
| SUM (≥200) | | | | 99 | ±70 | 8.2 | 52 |
| ALL ≥ 200 | 20 | 18 | 2 | 133 | ±120 | 11.0 | 70 |
| Highway Channel, 6A | | | | | | | |
| 100-199 | 10 | 5 | 1 | 33 | ±30 | 3.4 | 22 |
| 200-299 | 6 | 2 | 0 | -[a] | | | |
| 300-399 | 7 | 9 | 2 | 27 | ±27 | 2.8 | 18 |
| 400-499 | 4 | 18 | 4 | 19 | ±13 | 2.0 | 12 |
| SUM (≥200) | | | | 67 | ±35 | 7.0 | 44 |
| ALL ≥ 200 | 17 | 29 | 6 | 77 | ±47 | 8.0 | 51 |

Table 14. Continued.

| Reach/ size (mm) | Number marked | Number caught | Number recaptured | Population estimate | 95% CI | Number/ 100 m | Number/ ha |
|---|---|---|---|---|---|---|---|
| | | | Brook trout | | | | |
| Hailey, 2 | | | | | | | |
| 100-199 | 4 | 10 | 1 | 28 | ±28 | 1.5 | 8 |
| 200-299 | 8 | 4 | 1 | 22 | ±20 | 1.2 | 6 |
| 300-399 | 3 | 1 | 1 | 4 | -[a] | 0.2 | 1 |
| 400-499 | 0 | 0 | 0 | 0 | ±0 | 0.0 | 0 |
| SUM (≥200) | | | | 28 | ±20 | 1.5 | 8 |
| ALL ≥200 | 11 | 5 | 2 | 24 | ±17 | 1.3 | 6 |
| Starweather, 3 | | | | | | | |
| 100-199 | 4 | 1 | 0 | -[a] | | | |
| 200-299 | 1 | 0 | 0 | -[a] | | | |
| 300-399 | 0 | 0 | 0 | 0 | | | |
| 400-499 | 0 | 0 | 0 | 0 | | | |
| Gimlet, 4 | | | | | | | |
| 100-199 | 1 | 4 | 1 | 5 | ±4 | 0.3 | 2 |
| 200-299 | 1 | 9 | 0 | -[a] | | | |
| 300-399 | 1 | 3 | 1 | 4 | ±3 | 0.3 | 1 |
| 400-499 | 0 | 2 | 1[b] | 2 | ±1 | 0.1 | 1 |
| SUM (≥200) | | | | 26 | ±26 | 1.8 | 9 |
| ALL ≥200 | 2 | 14 | 2 | 15 | ±13 | 1.0 | 5 |
| Lake Creek, 6 | | | | | | | |
| 100-199 | 9 | 6 | 0 | -[a] | | | |
| 200-299 | 1 | 1 | 0 | -[a] | | | |
| 300-399 | 0 | 0 | 0 | 0 | ±0 | 0 | 0 |
| 400-499 | 0 | 0 | 0 | 0 | ±0 | 0 | 0 |
| Highway Channel, 6A | | | | | | | |
| 100-199 | 1 | 5 | 0 | 0 | ±0 | 0 | 0 |
| 200-299 | 0 | 1 | 0 | -[a] | | | |
| 300-399 | 0 | 0 | 0 | 0 | ±0 | 0 | 0 |
| 400-499 | 0 | 0 | 0 | 0 | ±0 | 0 | 0 |

[a] No population estimate made due to no marked fish being recaptured.

[b] No population estimate made due to number of marked fish recaptured exceeding number of fish marked.

A total of 85 rainbow trout were sampled both days with 61 identified as fish of hatchery origin, although IDFG does not stock the stream with rainbow trout. The hatchery fish most likely escaped from some of the upstream private hatcheries. On an annual basis IDFG stocks brown trout fingerlings into the uppermost end of the WMA. Only three of the 16 rainbow trout sampled on May 11 were recaptured from the marking run, thus preventing a population estimate. A total of 24 brown trout were sampled on both days combined. There were no recaptured brown trout on May 11. Total length frequencies of all fish species sampled in both runs are given in Table 15. Nongame fish sampled included 318 Utah chub *Gila atraria* and five redside shiner *Richardsonius balteatus*.

## Thousand Springs Creek

Thousand Springs Creek is a short stream originating from Snake River canyon springs approximately 58 m above the Snake River. Spring water emerges out of the canyon's formations where some is collected and diverted into a privately-owned hatchery on a bench approximately 50 m above the Snake River; the rest of it is diverted into a hydroelectric power plant operated by Idaho Power Company. The water leaves the two facilities and flows into a natural stream channel that forms Thousand Springs Creek. Immediately downstream from the power plant outflow, the stream splits into two diverging channels with approximately the same flow. The north channel averages 50 m wide and flows for approximately 800 m. The south channel averages 42 m wide and flows for approximately 550 m before entering the Snake River, thus creating an island between the Snake River and each of the channels. There is a day use park, open to the public, which is owned and maintained by Idaho Power Company near where water flows from the power plant. Most of the land surrounding the south channel of Thousand Springs Creek is owned by The Nature Conservancy, which allows public access for fishing and sightseeing.

The Nature Conservancy was concerned that some of the fish inhabiting Thousand Springs Creek, particularly nonnative brown trout, were predating on native fish species including Shoshone sculpin *Cottus greenei*. We electrofished 715 m of the north channel, 520 m of the south channel and 500 m of the Snake River adjacent to the island on the evening of June 15, 1995 for the purpose of sampling the existing fish community and to determine what some of the potentially piscivorous fish species were feeding on. A total length frequency analysis was done on all fish sampled (Tables 16-18) and a subsample of all potentially piscivorous fish species was sacrificed for stomach content analysis. Species sampled include rainbow trout of hatchery origin, rainbow trout of wild origin, mountain whitefish, speckled dace *Rhinichthys osculus* and longnose dace, peamouth chub *Mylocheilus caurinus*, redside shiner, mottled sculpin *Cottus bairdi* and unidentified sculpin species, and largescale sucker *Catostomus macrocheilus*.

A total of 16 rainbow trout ranging in total length from 215 to 440 mm (mean 295 mm) were sacrificed for stomach content analysis. Results of the analysis indicate that none of the rainbow trout consumed other fish. Food items found in the stomachs included at least two species of snails *Gastropods*, adult and larva flies *Diptera*, damselfly larva *Anisoptera*, caddisfly larva *Trichoptera*, beetle adults *Coleoptera*, water pennys *Psephenidae*, water boatmen *Corixidae*, and numerous unidentified insects. There were no vertebrates of any kind found in any of the rainbow trout stomachs.

Table 15. Fish sampled from Billingsley Creek at the wildlife management area with two electrofishing trips on April 27 and May 11, 1995. Total length frequency (mm) and mean weight (g) of some fish sampled are given.

| Length range (mm) | Hatchery rainbow trout | | | | Wild rainbow trout | | | | Brown trout | | | | Utah chub | | | | Redside shiner | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Weight | | Length | | Weight | | Length | | Weight | | Length | | Weight | | Length | |
| | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | avg. | no. | % |
| 0-9 | | | | | | | | | | | | | | | | | | |
| 10-19 | | | | | | | | | | | | | | | | | | |
| 20-29 | | | | | | | | | | | | | | | | | | |
| 30-39 | | | | | | | | | | | | | | | | | | |
| 40-49 | | | | | | | | | | | | | | | | | | |
| 50-59 | | | | | | | | | | | | | | | | | | |
| 60-69 | | | | | | | | | | | | | 1 | 0.4 | | | | |
| 70-79 | | | | | | | | | | | | | 3 | 1.3 | | | | |
| 80-89 | | | | | | | | | | | | | 1 | 0.4 | | | 2 | 40.0 |
| 90-99 | | | | | 1 | 4.2 | 1 | 8 | | | | | | | | | 2 | 40.0 |
| 100-109 | | | | | 1 | 4.2 | 1 | 10 | | | | | | | | | | |
| 110-119 | | | | | | | | | | | | | 5 | 2.1 | | | | |
| 120-129 | | | | | | | | | | | | | 22 | 9.4 | 1 | 24 | 1 | 20.0 |
| 130-139 | | | | | | | | | | | | | 31 | 13.2 | 2 | 31 | | |
| 140-149 | | | | | | | | | | | | | 25 | 10.7 | 7 | 37 | | |
| 150-159 | | | | | | | | | | | | | 24 | 10.3 | 4 | 45 | | |
| 160-169 | | | | | | | | | | | | | 7 | 3.0 | 2 | 49 | | |
| 170-179 | | | | | | | | | | | | | 12 | 5.1 | 3 | 66 | | |
| 180-189 | | | | | | | | | | | | | 9 | 3.8 | 2 | 85 | | |
| 190-199 | | | | | | | | | | | | | 14 | 6.0 | 1 | 106 | | |
| 200-209 | 1 | 1.6 | 1 | 77 | | | | | | | | | 22 | 9.4 | 3 | 118 | | |
| 210-219 | | | | | 1 | 4.2 | 1 | 100 | | | | | 15 | 6.4 | 2 | 138 | | |
| 220-229 | 2 | 3.3 | 2 | 106 | 1 | 4.2 | 1 | 110 | | | | | 13 | 5.6 | 1 | 154 | | |
| 230-239 | 3 | 4.9 | 3 | 119 | 2 | 8.3 | 2 | 132 | | | | | 9 | 3.8 | 1 | 182 | | |
| 240-249 | | | | | | | | | 1 | 4.2 | 1 | 154 | 6 | 2.6 | 1 | 222 | | |
| 250-259 | 3 | 4.9 | 3 | 159 | 1 | 4.2 | 1 | 158 | | | | | 6 | 2.6 | | | | |
| 260-269 | | | | | | | | | 1 | 4.2 | 1 | 190 | 4 | 1.7 | 1 | 260 | | |
| 270-279 | 3 | 4.9 | 3 | 212 | 1 | 4.2 | 1 | 182 | 2 | 8.3 | 2 | 224 | 2 | 0.9 | | | | |
| 280-289 | 4 | 6.6 | 4 | 247 | 1 | 4.2 | 1 | 219 | 3 | 12.5 | 3 | 223 | 1 | 0.4 | | | | |
| 290-299 | 4 | 6.6 | 4 | 251 | | | | | 3 | 12.5 | 3 | 270 | 2 | 0.9 | | | | |

Table 15. Continued.

| Length Range (mm) | Hatchery rainbow trout | | | | Wild rainbow trout | | | | Brown trout | | | | Utah chub | | | | Redside shiner | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Weight | | Length | | Weight | | Length | | Weight | | Length | | Weight | | Length | |
| | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | avg. | no. | % | no. | avg. | no. | % |
| 300-309 | 3 | 4.9 | 3 | 303 | 1 | 4.2 | 1 | 210 | 1 | 4.2 | 1 | 335 | 234 | | | | 5 | |
| 310-319 | 2 | 3.3 | 2 | 330 | 1 | 4.2 | 1 | 280 | 2 | 8.3 | 2 | 342.5 | 173.2 | | | | 96 | |
| 320-329 | 4 | 6.6 | 4 | 411 | | | | | 3 | 12.5 | 3 | 375 | | | | | | |
| 330-339 | 4 | 6.6 | 4 | 401 | 1 | 4.2 | 1 | 375 | 1 | 4.2 | 1 | 370 | 318 | | | | 5 | |
| 340-349 | 2 | 3.3 | 2 | 350 | 2 | 8.3 | 2 | 425 | | | | | | | | | | |
| 350-359 | 4 | 6.6 | 3 | 473 | 2 | 8.3 | 2 | 435 | | | | | | | | | | |
| 360-369 | 5 | 8.2 | 5 | 515 | 2 | 8.3 | 2 | 460 | | | | | | | | | | |
| 370-379 | 2 | 3.3 | 2 | 520 | 1 | 4.2 | 1 | 420 | 1 | 4.2 | 1 | 570 | | | | | | |
| 380-389 | 1 | 1.6 | 1 | 620 | | | | | 1 | 4.2 | 1 | 475 | | | | | | |
| 390-399 | 1 | 1.6 | 1 | 730 | 1 | 4.2 | 1 | 490 | | | | | | | | | | |
| 400-409 | | | | | 1 | 4.2 | 1 | 615 | 1 | 4.2 | 1 | 620 | | | | | | |
| 410-419 | 2 | 3.3 | 2 | 763 | | | | | 1 | 4.2 | 1 | 695 | | | | | | |
| 420-429 | | | | | | | | | 1 | 4.2 | 1 | 745 | | | | | | |
| 430-439 | 4 | 6.6 | 4 | 836 | 2 | 8.3 | 1 | 740 | | | | | | | | | | |
| 440-449 | 2 | 3.3 | 2 | 1,100 | 1 | 4.2 | 1 | 840 | 1 | 4.2 | 1 | 960 | | | | | | |
| 450-459 | 2 | 3.3 | 2 | 1,100 | | | | | | | | | | | | | | |
| 460-469 | 3 | 4.9 | 3 | 1,003 | | | | | 1 | 4.2 | 1 | 1,200 | | | | | | |
| 470-479 | | | | | | | | | | | | | | | | | | |
| 480-489 | | | | | | | | | | | | | | | | | | |
| 490-499 | | | | | | | | | | | | | | | | | | |
| Number: | 61 | | | | 24 | | | | 24 | | | | | | | | | |
| Avg length: | 336 | | | | 310 | | | | 328 | | | | | | | | | |
| Total sampled: | 61 | | | | 24 | | | | 24 | | | | | | | | | |

## DEQ STREAM SURVEY RESULTS

The Idaho Division of Environmental Quality (DEQ) performed numerous stream surveys for its Beneficial Use Reconnaissance Project (BURP). Methods used included sampling fish with a backpack electroshocker then recording total numbers of each species of fish sampled with total length measurements on a subsample of fish. Fish sampling results are given in Table 19.

Table 16. Fish sampled by electrofishing and selectively netting for game fish species in the north channel of Thousand Springs Creek. Total length frequency in each 10 mm length group, average weight (g) of some wild rainbow trout, and percent of total sampled, June 15, 1995 are given.

| Length range (mm) | Hatchery rainbow trout | | Wild rainbow trout | | | | Dace[a] | | Peamouth chub | | Redside shiner | | Sculpin[b] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Weight | | Length | | Length | | Length | | Length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % | no. | % | no. | % |
| 0-9 | | | | | | | | | | | | | | |
| 10-19 | | | | | | | | | | | | | | |
| 20-29 | | | | | | | | | | | | | | |
| 30-39 | | | | | | | | | | | | | | |
| 40-49 | | | | | | | | | | | | | 3 | 23.1 |
| 50-59 | | | | | | | | | | | | | 5 | 38.5 |
| 60-69 | | | | | | | | | | | | | 3 | 23.1 |
| 70-79 | | | | | | | 2 | 22.2 | | | | | | |
| 80-89 | | | | | | | 4 | 44.4 | | | 1 | 100.0 | | |
| 90-99 | | | 1 | 0.4 | | | 2 | 22.2 | | | | | 1 | 7.7 |
| 100-109 | | | | | | | | | | | | | | |
| 110-119 | | | | | | | 1 | 11.1 | | | | | 1 | 7.7 |
| 120-129 | | | | | | | | | | | | | | |
| 130-139 | | | | | | | | | 2 | 40.0 | | | | |
| 140-149 | | | | | | | | | 3 | 60.0 | | | | |
| 150-159 | | | | | | | | | | | | | | |
| 160-169 | | | | | | | | | | | | | | |
| 170-179 | 1 | 100.0 | | | | | | | | | | | | |
| 180-189 | | | 2 | 7.4 | 1 | 58 | | | | | | | | |
| 190-199 | | | 2 | 7.4 | 1 | 68 | | | | | | | | |

Table 16. Continued.

| Length range (mm) | Hatchery rainbow trout | | Wild rainbow trout | | | | Dace[a] | | Peamouth chub | | Redside shiner | | Sculpin[b] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Weight | | Length | | Length | | Length | | Length | |
| | no. | % | no. | % | no. | avg. | no. | % | no. | % | no. | % | no. | % |
| 200-209 | | | 4 | 14.8 | 1 | 78 | | | | | | | | |
| 210-219 | | | 4 | 14.8 | 1 | 95 | | | | | | | | |
| 220-229 | | | 5 | 18.5 | | | | | | | | | | |
| 230-239 | | | 2 | 7.4 | 2 | 113 | | | | | | | | |
| 240-249 | | | 1 | 3.7 | 1 | 125 | | | | | | | | |
| 250-259 | | | 1 | 3.7 | 1 | 148 | | | | | | | | |
| 260-269 | | | | | | | | | | | | | | |
| 270-279 | | | | | | | | | | | | | | |
| 280-289 | | | | | | | | | | | | | | |
| 290-299 | | | | | | | | | | | | | | |
| 300-309 | | | 2 | 7.4 | 2 | 288 | | | | | | | | |
| 310-319 | | | | | | | | | | | | | | |
| 320-329 | | | | | | | | | | | | | | |
| 330-339 | | | | | | | | | | | | | | |
| 340-349 | | | 1 | 3.7 | 1 | 350 | | | | | | | | |
| 350-359 | | | | | | | | | | | | | | |
| ^360-369 | | | 1 | 3.7 | 1 | 395 | | | | | | | | |
| 370-379 | | | | | | | | | | | | | | |
| 380-389 | | | | | | | | | | | | | | |
| 390-399 | | | 1 | 3.7 | 1 | 575 | | | | | | | | |
| Number: | 1 | | 27 | | 13 | | 9 | | 5 | | 1 | | 13 | |
| Avg. length: | 175 | | 233 | | | | 74 | | 128 | | 75 | | 39 | |
| Total sampled: | 1 | | 27 | | 13 | | 9 | | 5 | | 1 | | 13 | |

[a] Both longnose and speckled dace may have been present in the sample.
[b] Although mottled sculpin were confirmed to be present in the sample, several sculpin were unidentifiable to species.

Table 17. Nongame fish sampled by electrofishing the south channel and Snake River near west side of island of Thousand Springs Preserve with total length frequency in each 10 mm length group and percent of total sampled, June 15, 1995.

| Length range (mm) | Largescale sucker | | Dace[a] | | Peamouth chub | | Sculpin[b] | | Redside shiner | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Length | | Length | | Length | | Length | | Length | |
| | no. | % | no. | % | no. | % | no. | % | no. | % |
| 50-59 | | | | | | | | | | |
| 60-69 | | | 1 | 1.3 | | | 1 | 1.2 | | |
| 70-79 | | | 4 | 5.0 | | | | | 1 | 100.0 |
| 80-89 | | | 4 | 5.0 | | | | | | |
| 90-99 | | | 1 | 1.3 | | | | | | |
| 100-109 | | | 1 | 1.3 | | | 1 | 1.2 | | |
| 110-119 | | | | | | | | | | |
| 120-129 | | | | | | | | | | |
| 130-139 | | | | | | | | | | |
| 140-149 | | | | | 3 | 1.2 | | | | |
| / | | | | | | | | | | |
| 200-209 | | | | | | | | | | |
| 210-219 | 1 | 0.2 | | | | | | | | |
| 220-229 | | | | | | | | | | |
| 230-239 | | | | | | | | | | |
| 240-249 | | | | | | | | | | |
| / | | | | | | | | | | |
| 300-309 | | | | | | | | | | |
| 310-319 | | | | | | | | | | |
| 320-329 | | | | | | | | | | |
| 330-339 | | | | | 1 | 0.4 | | | | |
| 340-349 | | | | | | | | | | |
| 350-359 | | | | | 2 | 0.8 | | | | |
| 360-369 | | | | | | | | | | |
| 370-379 | | | | | 1 | 0.4 | | | | |
| 380-389 | | | | | | | | | | |
| 390-399 | | | | | | | | | | |

Table 19. Synopsis of data collected in 1995 for the Idaho Department of Health and Welfare Division of Environmental Quality Beneficial Use Reconnaissance Project.

| Name | EPA # 170402 | Location | Mean stream width (m) | Site length (m) | Species[a] sampled (# sampled) | Max. length (mm) | Min. length (mm) | Mean length (mm) |
|---|---|---|---|---|---|---|---|---|
| Baker Creek (lower) | 19048.00 | T05N R16E S09 NE1/4 SE1/4 NW1/4 | >5 | 140 | BKT (6) | 160 | 30 | 61 |
| | | | | | RBT (2) | 125 | 90 | 107.5 |
| | | | | | SCU (6) | 85 | 30 | 65 |
| Baker Creek (upper) | 19050.00 | T04N R15E S11 NW1/4 NW1/4 SE1/4 | <5 | 120 | NONE | | | |
| Boulder Creek | 19041.00 | T05N R16E S11 NE1/4 NW1/4 SE1/4 | <5 | 100 | BKT (2) | 95 | 90 | 92.5 |
| | | | | | Unknown (2) | 30 | 25 | 27.5 |
| | | | | | SCU (27) | 80 | 25 | 45.5 |
| Cottonwood Creek | 13104.00 | T15S R18E S22 SE1/4 SW1/4 NW1/4 | <5 | 100 | LND (2) | 60 | 60 | 60 |
| | | | | | SD (42) | 75 | 30 | 52 |
| | | | | | SD (75) | -- | -- | -- |
| | | | | | RSS (40) | 95 | 35 | 56 |
| | | | | | RSS (6) | -- | -- | -- |
| | | | | | Unknown (3) | -- | -- | -- |
| Cove Creek | 19020.00 | T04N R19E S33 SW1/4 NE1/4 NW1/4 | <5 | 132 | NONE | | | |
| Croy Creek | 19058.00 | T02N R17E S34 NW1/4 NE1/4 SE1/4 | <5 | 100 | WRBT (8) | 190 | 70 | 152.5 |
| Dry Creek (lower) | 12043.00 | T11S R20E S07 SE1/4 SE1/4 SE1/4 | <5 | 120 | LND (2) | 110 | 80 | 95 |
| | | | | | RSS (24) | 120 | 45 | 82 |
| | | | | | SD (52) | 105 | 45 | 59 |
| | | | | | Unknown (1) | 110 | 110 | 110 |
| Dry Creek (upper) | 12039.00 | T12S R19E S24 NE1/4 SE1/4 SE1/4 | <5 | 100 | CT (7) | 200 | 120 | |

Table 19. Continued.

| Name | EPA # 170402 | Location | Mean stream width (m) | Site length (m) | Species[a] sampled (# sampled) | Max length (mm) | Min length (mm) | Mean length (mm) |
|---|---|---|---|---|---|---|---|---|
| Eagle Creek (lower) | 19035.00 | T05N R17E S12 SW1/4 NE1/4 SW1/4 | <5 | 100 | BKT (9)<br>SCU (37) | 115<br>90 | 50<br>40 | 61<br>55 |
| Eagle Creek (upper) | 19034.00 | T05N R18E S01 SW1/4 NE1/4 NW1/4 | <5 | 100 | RBT (1)<br>BKT (14) | 135<br>220 | 135<br>55 | 135<br>110 |
| Ellison Creek | 12034.00 | T09S R16E S15 | <5 | 50 | NONE | | | -- |
| Greenhorn Creek | 10980.00 | T03N R17E S15 NE1/4 NE1/4 SW1/4 | <5 | 100 | WRBT (1)<br>BKT (1)<br>SCU (13) | 185<br>255<br>95 | 185<br>255<br>45 | 185<br>255<br>73 |
| Indian Creek | 19079.00 | T03N R18E S33 SW1/4 NW1/4 NE1/4 | <5 | 100 | BKT (14) | 215 | 145 | 177 |
| Lake Creek | 19031.00 | T05N R18E S17 NE1/4 SE1/4 NE1/4 | <5 | 100 | BKT (3)<br>RBT (1)<br>SCU (45) | 130<br>240<br>110 | 100<br>240<br>45 | 113<br>240<br>71 |
| Little Cottonwood Creek | XXX | T14S R20E S14 NE1/4 SW1/4 SW1/4 | <5 | 100 | NONE | | | -- |
| Owens Creek | XXX | T02N R14E S29 NW1/4 NW1/4 SE1/4 | <5 | 100 | NONE | | | -- |
| Pole Camp Creek | XXX | T14S R17E S12 SE1/4 SE1/4 SE1/4 | <5 | 110 | WRBT (3)<br>RSS (2)<br>SD (49) | 105<br>100<br>65 | 40<br>80<br>45 | 62<br>90<br>53 |

Table 19. Continued.

| Name | EPA # 170402 | Location | Mean stream width (m) | Site length (m) | Species[a] sampled (# sampled) | Max length (mm) | Min length (mm) | Mean length (mm) |
|---|---|---|---|---|---|---|---|---|
| Quigley Creek | 19078.00 | T03N R19E S31 NW1/4 SW1/4 SW1/4 | <5 | 100 | BKT (17) | 200 | 70 | 136 |
| | | | | | SCU (1) | 110 | 110 | 110 |
| Riley Creek (lower) | 12011.00 | T08S R14E S06 NW1/4 SE 1/4 NW1/4 | >5 | 400 | WRBT (22) | 280 | 50 | 127 |
| | | | | | SCU (9) | 80 | 45 | 65 |
| Shoshone Creek | 13091.00 | T16S R16E S19 SE1/4 NW1/4 NW1/4 | >5 | 180 | SMB (3) | 90 | 20 | 43 |
| | | | | | CMC (15) | 200 | 45 | 103 |
| | | | | | SQF (8) | 200 | 95 | 145 |
| | | | | | RBT (1) | 155 | 155 | 155 |
| | | | | | WRBT (3) | 125 | 120 | 123 |
| | | | | | SCU (18) | 75 | 30 | 59 |
| | | | | | RSS (18) | 135 | 55 | 93 |
| | | | | | Unknown Suckers (71) | 225 | 60 | 118 |
| | | | | | Unknown (1) | 20 | 20 | 20 |
| Slaughter House Creek | 10915.00 | T02N R20E S17 SE1/4 NW1/4 SW1/4 | <5 | 100 | BKT (47) | 230 | 50 | 118 |
| Grindstone Creek | 13XXX | T03N R14E S27 SE1/4 SE1/4 SE1/4 | <5 | 130 | RBT (4) | 200 | 95 | 129 |
| | | | | | WRBT (1) | 140 | 140 | 140 |
| | | | | | SCU (30) | 110 | 40 | 68 |
| | | | | | SCU (1) | -- | -- | -- |

[a] BKT=Brook trout, LND=Longnose dace, WRBT=Wild rainbow trout, RBT=Rainbow trout, SD=Speckled dace, SMB=Smallmouth bass, SCU=Sculpin, RSS=Redside shiner, CMC=Chiselmouth chub.

## LITERATURE CITED


Elle, S. 1998. Rivers and Streams Investigations. Wild Trout Investigations. Job Performance Report. Project F-73-R-18. Idaho Department of Fish and Game, Boise.

IDFG (Idaho Department of Fish and Game). 1992. Standard Stream Surveys. Standardized methodologies for stream habitat surveys. Unpublished document. Fisheries Bureau, IDFG, Boise.

Partridge, F.E. and C.D. Warren. 1994. Regional fisheries management investigations. Idaho Department of Fish and Game, 1991 Job Performance Report. Project F-71-R-16, Boise.

Partridge, F.E. and C.D. Warren. 1995. Regional fisheries management investigations. Idaho Department of Fish and Game, 1993 Job Performance Report. Project F-71-R-18, Boise.

Ricker, W.E. 1975. Computation and Interpretation of Biological Statistics of Fish Populations. Department of the Environment, Fisheries and Marine Service. Ottawa, Canada.

Seber, G.A.F. and E.D. LeCren. 1967. Estimating population parameters from catches large relative to the population. Journal of Animal Ecology 36: 631-643.

Thurow, R. F. 1990. Federal Aid in Fish Restoration. Job Completion Report. Project F-73-R-12, Wood River Fisheries Investigations. Idaho Department of Fish and Game, Boise.

Warren, C.D. and F.E. Partridge. 1994. Regional fisheries management investigations. Idaho Department of Fish and Game, 1992 Job Performance Report. Project F-71-R-17, Boise.

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-20

Project II: Technical Guidance

Subproject II-E: Magic Valley Region

Contract Period: July 1, 1995 to June 30, 1996

## ABSTRACT

Magic Valley Region fishery management personnel furnished verbal and written technical guidance to other agencies, consultants, and private individuals and organizations. Fishing information was provided to anglers in the forms of brochures, angler guides, public meetings, news releases, by telephone and in person.

Personnel commented on, participated in, or otherwise addressed and attended meetings regarding many miscellaneous fisheries activities.

Author:

Fred E. Partridge
Regional Fishery Manager

## OBJECTIVE

To furnish technical assistance, advice, guidance, and comments to other agencies, organizations, and individuals regarding any items, projects, or activities associated with or potentially affecting fishery resources and habitat in the region.

## RECOMMENDATIONS

Technical guidance on issues involving fishery resources in the Magic Valley Region should be continued to assist in maintaining fishery resources.

## METHODS

Reviews, field inspections, comments, expertise, and recommendations were furnished to all governmental agencies, private organizations, consultants and individuals upon request. We participated in meetings, tours, and gave presentations where requested or necessary. Expertise on regional fisheries was provided to the Regional Environmental Coordinator to assist in commenting on the numerous habitat-related projects in the region.

## FINDINGS

Magic Valley regional fishery management personnel collected data, inspected, commented on and\or provided advice on the following major projects in 1995:

1. Hydroelectric projects - Time was spent on ten hydro projects in the Magic Valley Region during 1995. Five of the projects are located on the Snake River and one each on the Little Wood River, Big Wood River, Malad River, Niagara Springs and Cedar Draw Creek.

2. Public information - Prepared and provided input on fishing, recreation and access brochures for the Region including Magic and Anderson Ranch reservoir brochures and the statewide angler guide. Worked with the BLM and regional tourism council on a Snake River Recreational brochure. Provided regional fishing information for ASKFISH 1-800 service and as requested by public and media. Provided information to local fishing clubs and elementary school classes on regional fisheries and basic habitat needs of fish in the Magic Valley Region.

3. Stream alterations - Evaluations of a spawning gravel site found spring and fall use by trout where a landowner had improved trout spawning in Silver Creek. Assistance was provided for the Regional Environmental Coordinator with site inspections and comments on projects on five different streams and rivers in the region.

4. Agency assistance - Regional fishery personnel provided equipment and assistance to US Geological Service, Idaho Division of Environmental Quality, US Forest Service and Bureau of Land Management in the collection of fish to provide long term monitoring of water quality conditions in rivers and streams and to document the presence or absence of fish species. Comments and data were provided to federal agencies for the Eastside Columbia Basin Assessment, various bull trout projects, and the BLM Riverwood management plan.

5. Water rights - Provided information to and worked with the Natural Resources Policy Bureau, the Department of Water Resources and private individuals on water rights and minimum flows for Billingsley Creek, Cedar Draw Creek and Jarbidge River.

6. Worked with personnel from Rupert, Albion, Featherville, and Jerome on the development and/or improvement of fishing ponds.

7. Continued to work with personnel from Amalgamated Sugar Company regarding mitigation of its spill into Rock Creek. Investigated a minor, non-lethal spill by Avonmore Cheese Company into Little Wood River.

## 1996 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-20

Project III: Habitat Management

Subproject II-E: Magic Valley Region

Contract Period: July 1, 1995 to June 30, 1996

## ABSTRACT

No habitat management activities were performed during this time period.

Author:

Fred E. Partridge
Regional Fishery Manager

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-20

Project IV: Population Management

Subproject IV-E: Magic Valley Region

Contract Period: July 1, 1995 to June 30, 1996

## ABSTRACT

Fish populations and fishing in the Magic Valley Region were enhanced by stocking approximately 3.0 million put-and-grow and 0.6 million put-and-take size fish into lakes, reservoirs, rivers and streams accessible by vehicle. High mountain lakes were stocked with 5,500 Henrys Lake cutthroat trout *Oncorhynchus clarki* and 4,800 Arctic grayling *Thymallus arcticus* fingerlings.

Author:

Fred E. Partridge
Regional Fishery Manager

## OBJECTIVES

To maintain suitable fish populations by supplementing or reestablishing desirable species and/or removal of undesirable species to provide the angling public with diverse fishing opportunities.

## METHODS

Trout populations in the Magic Valley Region were supplemented with both put-and-grow (51-202 mm) and put-and-take (203-660 mm) kokanee *Oncorhynchus nerka*, rainbow trout *O. mykiss*, cutthroat trout *O. clarki*, and brown trout *Salmo trutta* which were reared primarily in Idaho Department of Fish and Game hatcheries. Other facilities which supplied trout released in the region included a private hatchery. Channel catfish *Ictalurus punctatus* were provided by Idaho Power Company mitigation for Milner Reservoir and walleye *Stizostedion vitreum* for Salmon Falls Creek Reservoir were obtained from Garrison National Fish Hatchery. Except for roadless alpine lakes and the following listed waters, all waters were stocked from hatchery trucks by hatchery personnel. Listed waters and alpine lakes, which were stocked by backpacking plastic bags of fish and water, were planted by regional personnel and volunteers.

## RESULTS AND DISCUSSION

### Hatchery Releases

Eight high mountain lakes were stocked with 10,300 fingerling trout and Arctic grayling *Thymallus arcticus* in the region in 1995. Independence #2 and #3, Big Lost and Hideaway lakes received 4,800 Arctic grayling and Titus, Cleveland, Big Trinity and Little Trinity lakes were stocked with 5,500 cutthroat trout. The Trinity Lakes and Lake Cleveland also receive catchable rainbow trout for diversity. Additionally, 19 rivers, streams and canals and 41 reservoirs, lakes and ponds were stocked with approximately 2.04 million put-and-grow and 0.55 million put-and-take size kokanee, rainbow and brown trout (IDFG 1996).

### Little Camas Reservoir

Following a fish eradication project in Little Camas Reservoir in 1994 (Warren and Partridge In Press), trout and smallmouth bass were reestablished in 1995. A total of 14,560 catchable sized and 50,250 fingerling rainbow trout were stocked in April, 1995 and 40,950 rainbow trout fingerlings were released in September, 1995. A total of 261 smallmouth bass *Micropterus dolomieu* which were captured by Magic Valley Bass clubs fishing in Salmon Falls Creek Reservoir were released in Little Camas Reservoir on July 15, 1995.

## Lower Salmon Falls Reservoir

On July 12 and August 10,1995, a total of 459 largemouth bass *Micropterus salmoides* averaging 158 mm and 144 bluegill *Lepomis macrochirus* averaging 49 mm were moved from a nearby private pond to Lower Salmon Falls Reservoir. The fish were obtained by a local fishing club for stocking into the reservoir. All the bass were marked with a left maxillary clip to monitor survival and impacts on reservoir populations.

## Milner Reservoir Canals

In late October and early November, 1995 three attempts were made to salvage game fish from the upper end of the north and south side canals below Milner Reservoir by regional personnel and volunteers. Relatively few trout (<100) were collected although a few were of large size (up to 2 kg). Other game fish found were yellow perch *Perca flavescens*, brown bullhead *Ameiurus nebulosus*, mountain whitefish *Prosopium williamsoni* and channel catfish. One large catfish was estimated to weigh more than 10 kg.

## Salmon Falls Creek Reservoir

Approximately one million walleye sac-fry obtained from Garrison National Fish Hatchery in North Dakota were stocked into Salmon Falls Creek Reservoir on May 20, 1995.

## ACKNOWLEDGEMENTS

Numerous people assisted regional fishery personnel with work on the previous projects. Specifically, we thank Technician Karen Frank and Aide Jason Kohl who did much of the field work and data analysis, and John DerHovanisian, Jeff Dillon, Chuck Alexander and their fishery research field crew who assisted on several of the field projects. We also thank personnel in the Magic Valley Region Enforcement Bureau with their assistance and input on numerous field projects as well as volunteers with the Reservists program who put in several hours of their own time for some of our projects. Officers Roger Olson and Bob Sellers assisted with mountain lake stocking. Hatchery personnel from Hagerman and Hayspur hatcheries did the bulk of the fish rearing and distribution in the region as well as assisting on projects as needed. We also thank Sue Coughlin and Sherri Moedl who assisted with the preparation of this report.

## LITERATURE CITED

Idaho Department of Fish and Game. 1996. 1995 Stocking Records Statewide, Boise.

Warren, C.D. and F.E. Partridge. 1996. Federal Aid in Fish Restoration. Job Performance Report. Project F-71-R-19, Regional Fisheries Management Investigations. Job 4-b, Region 4 Lowland Lakes and Reservoirs Investigations. Idaho Department of Fish and Game, Boise.

Submitted by:

Fred Partridge
Regional Fishery Manager

Charles D. Warren
Regional Fishery Biologist

Karen A. Frank
Fishery Technician

Approved by:

David Parrish, Regional Supervisor